A technical manual from the experts in *Business-Critical Continuity™*

NetSure™ -48V DC Power System

Installation Guide

Section 5957 (Issue AM, March 26, 2014)

SPEC. NO.	MODEL
582140000	802NLDB 802NLEB 802NL-B

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Network Power

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Preface

This document (Section 5957) provides an *Installation Guide* for Power System Models **802NLDB** (208V Input Power/Distribution and Power Only Bays), **802NLEB** (480V Input Power/Distribution and Power Only Bays, and **802NL-B** (Distribution Only Bay); Spec. No. **582140000**. This is a condense version of the *Installation Instructions* (Section 5876). Section 5876 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

For *User Instructions*, refer to Section 5877 provided on the CD (Electronic Documentation Package) furnished with your system.

Refer to SAG582140000 (*System Application Guide*) for additional information. The SAG can be accessed via the CD (Electronic Documentation Package) furnished with your system.

For a color MCA Menu Tree, refer to Section 5886. Section 5886 is provided in the separate *INSTALLATION MANUAL* and the *CD CARRIER MANUAL* (it is also provided on the CD).

Your Power System may contain an optional LMS Monitoring System, refer to Section 5879 (*LMS1000 Installation Instructions*) and Section 5847 (*LMS1000 User Instructions*) provided on the CD (Electronic Documentation Package) furnished with your system.

Danger: INSTALLERS MUST FOLLOW APPROVED SAFETY PROCEDURES.

This system operates from AC voltage capable of producing fatal electrical shock. AC input power must be completely disconnected from the branch circuits wiring used to provide power to the system before any electrical connections are made. DO NOT apply AC power to the system until all electrical connections have been completed and checked.

This system may also require battery to be connected. Although battery voltage is not hazardously high, the battery can deliver large amounts of current. Exercise extreme caution not to inadvertently contact or have any tool inadvertently contact a battery terminal or exposed wire connected to a battery terminal. NEVER allow a metal object, such as a tool, to contact more than one termination at a time, or to simultaneously contact a termination and a grounded object. Even a momentary short circuit can cause explosion and injury. Remove watches, rings, or other jewelry before connecting battery leads. Make the DC (battery) connections last. Make all other electrical connections without DC input power applied to the system.

Warning: Before handling any circuit card, read and follow the instructions contained on the Static Warning Page located at the beginning of this document. A static wrist strap grounded through a one megohm resistor should always be worn when handling the circuit cards.

Note: *Apply electrical anti-oxidation compound to mating surfaces of busbars before connecting together.*

Wiring Considerations

For recommended wire sizes, crimp lugs, branch circuit protection, alarm relay contact ratings, and general wiring information and restrictions; refer to System Application Guide SAG582140000. The SAG can be accessed via the CD (Electronic Documentation Package) furnished with your system.

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Refer to drawing 031110100 for lug crimping information. Refer to drawings 031110200 and 031110300 for additional lug information. These are located in the *Installation Manual*.

All wiring and branch circuit protection should follow the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), and applicable local codes. For operation in countries where the NEC is not recognized, follow applicable codes. For field wiring, use wires suitable for at least 75°C.

Installation Acceptance Checklist

Placing the Bays and Installing Internal/External Busbars

- ❑ Bays (and PDSC if furnished) Bolted Together (if required) and Mounted to Floor
- ❑ Bay-to-Bay Busbar Links Installed (if required)
- ❑ PDSC (if furnished) AC Input Connectors Connected to Power/Distribution Bay
- ❑ External Top-Mount Busbar Assemblies Installed (if furnished)

Installing Distribution Devices, MCA Relay Circuit Cards, and MCA I/O Circuit Cards

- ❑ Distribution Fuses and Circuit Breakers Installed
- ❑ Distribution Lug Adapter Plates Installed
- ❑ MCA Customer Alarm Relay Circuit Card(s) Installed (if required)
- ❑ MCA I/O Circuit Card(s) Installed (if required)

Making Electrical Connections

- ❑ MCA Network Bay Interconnections Made
- ❑ MCA Battery Charge Digital Temperature Compensation Probe Mounted and Connected (if furnished)
- ❑ MCA External Alarm, Reference, and Control Connections Made
- ❑ Connections Made to all MCA I/O Circuit Cards Installed
- ❑ LMS Local Port Connection Made (If Required)
- ❑ Bay(s) Frame Grounding Connections Made
- ❑ Bay(s) Load Connections Made
- ❑ Bay(s) AC Input and AC Input Ground Connections Made
- ❑ Battery Connections Made
- ❑ All Shields and Cover Panels in Place

Installing the Rectifiers and Setting Switch Options

- ❑ Rectifiers Installed
- ❑ MCA and Router Circuit Cards Switches Set
- ❑ Distribution Bus Monitoring Circuit Cards Jumper Set

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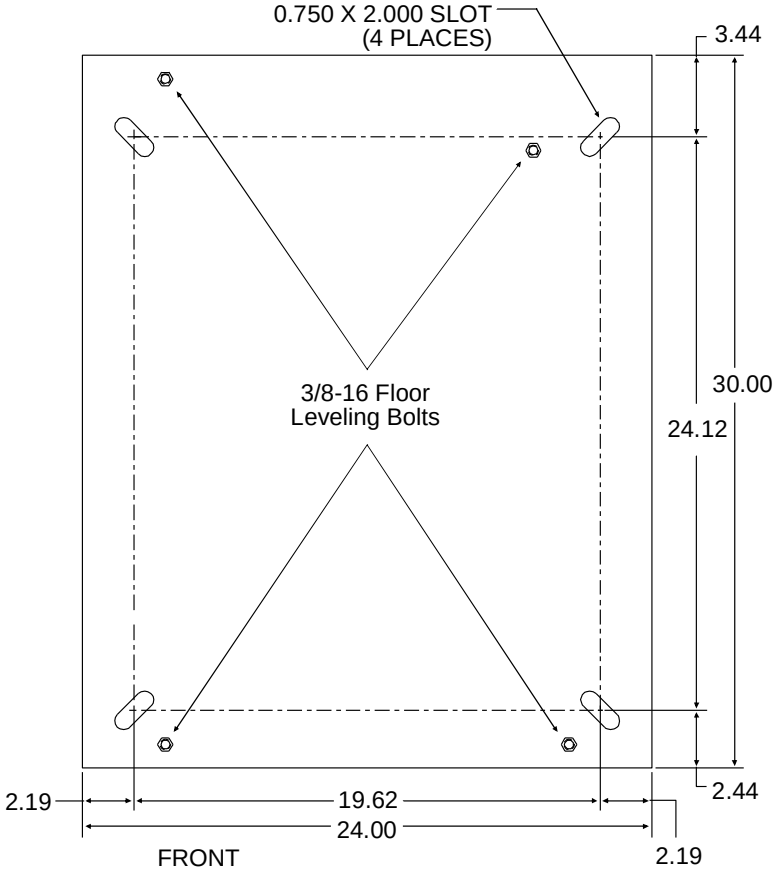
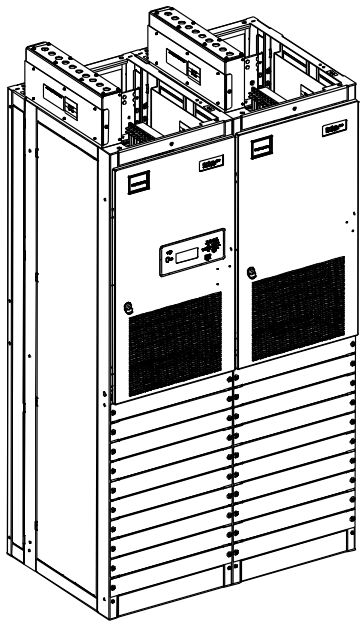
Floor Mounting Hole Dimensions -
Primary and Secondary Power/Distribution Bays without PDSC
(Power Only Bays Have the Same Hole Pattern)
(all dimensions in inches)



Floor Hole Drilling Pattern
Power/Distribution Bay



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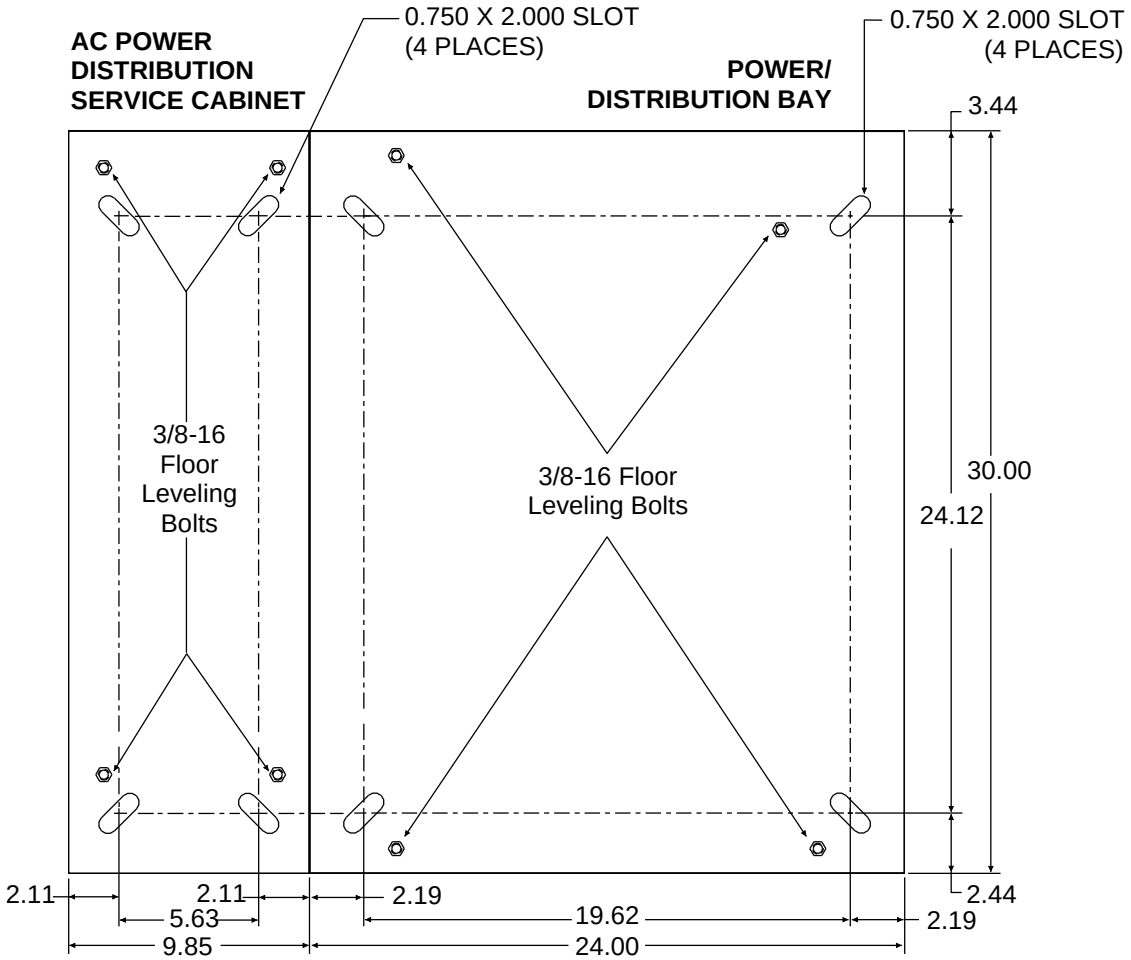
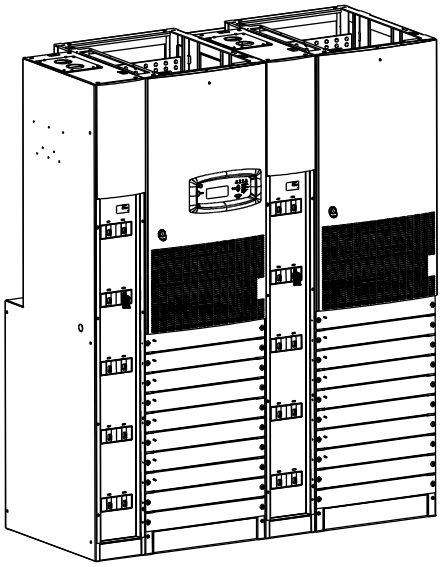
Floor Mounting Hole Dimensions -
Primary and Secondary Power/Distribution Bays with PDSC
(all dimensions in inches)





Floor Hole Drilling Pattern
Power/Distribution Bay
and PDSC

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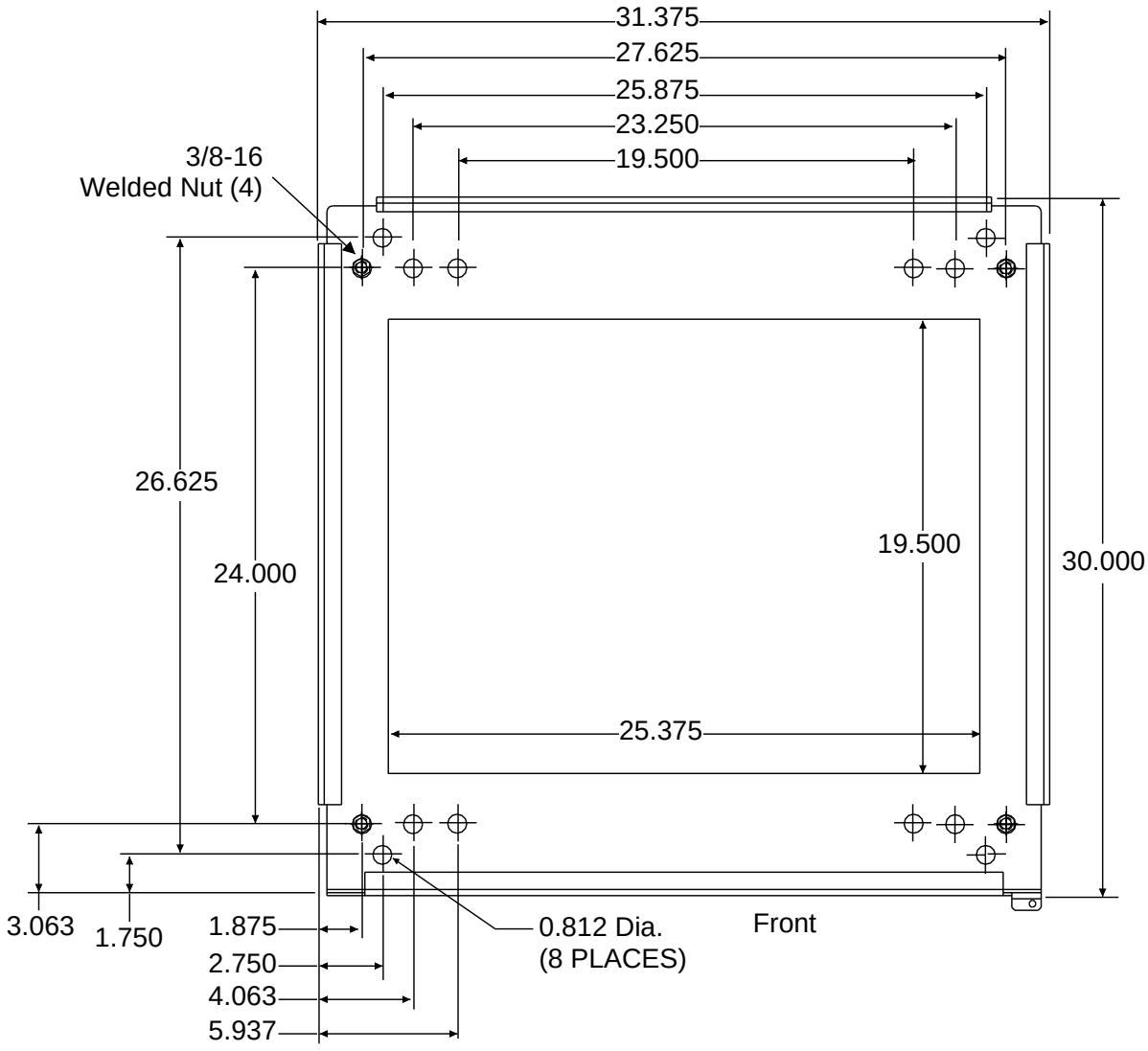
Floor Mounting Hole Dimensions -
Distribution Only Bay (all dimensions in inches)



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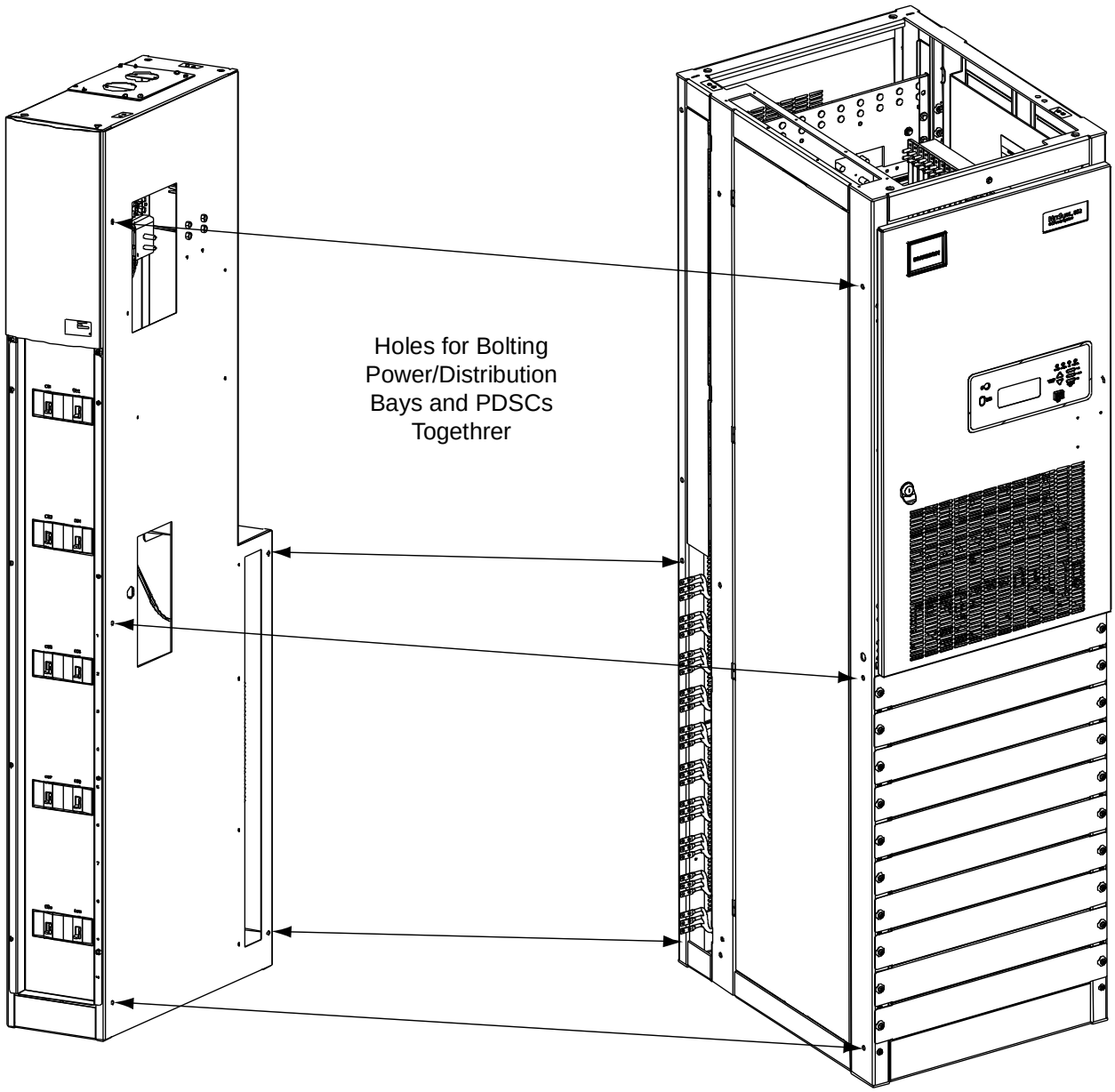
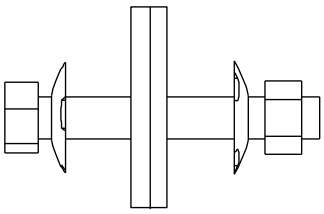
Bolting Power/Distribution Bay to PDSC Cabinet

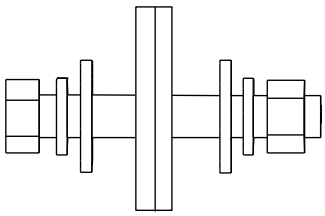


Bay/Cabinet Sides



Hardware Build-Up: (use ground washers in center tie points each side)
Bolt, Ground Washer, Bay/Cabinet Sides, Ground Washer, Nut

Bay/Cabinet Sides



Hardware Build-Up: (use in remaining connection points)
Bolt, Lock Washer, Flat Washer, Bay/Cabinet Sides, Flat Washer, Lock Washer, Nut

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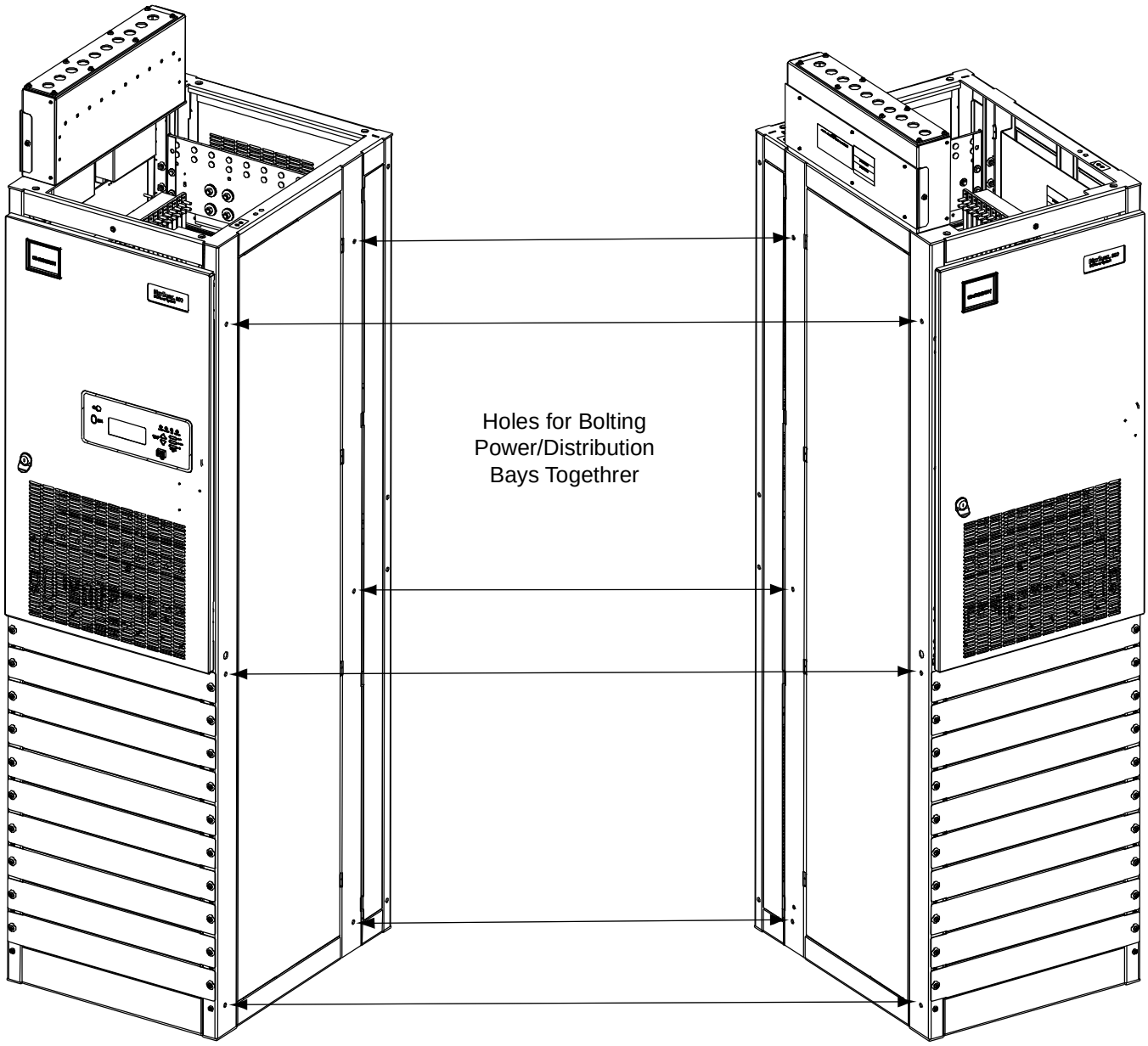
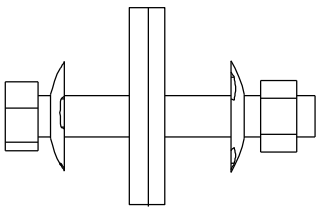
Bolting Power/Distribution Bay to Power/Distribution Bay

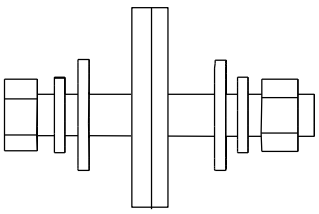


Bay/Bay Sides



Hardware Build-Up: (use ground washers in center tie points each side)
Bolt, Ground Washer, Bay/Cabinet Sides, Ground Washer, Nut

Bay/Bay Sides



Hardware Build-Up: (use in remaining connection points)
Bolt, Lock Washer, Flat Washer, Bay/Cabinet Sides, Flat Washer, Lock Washer, Nut

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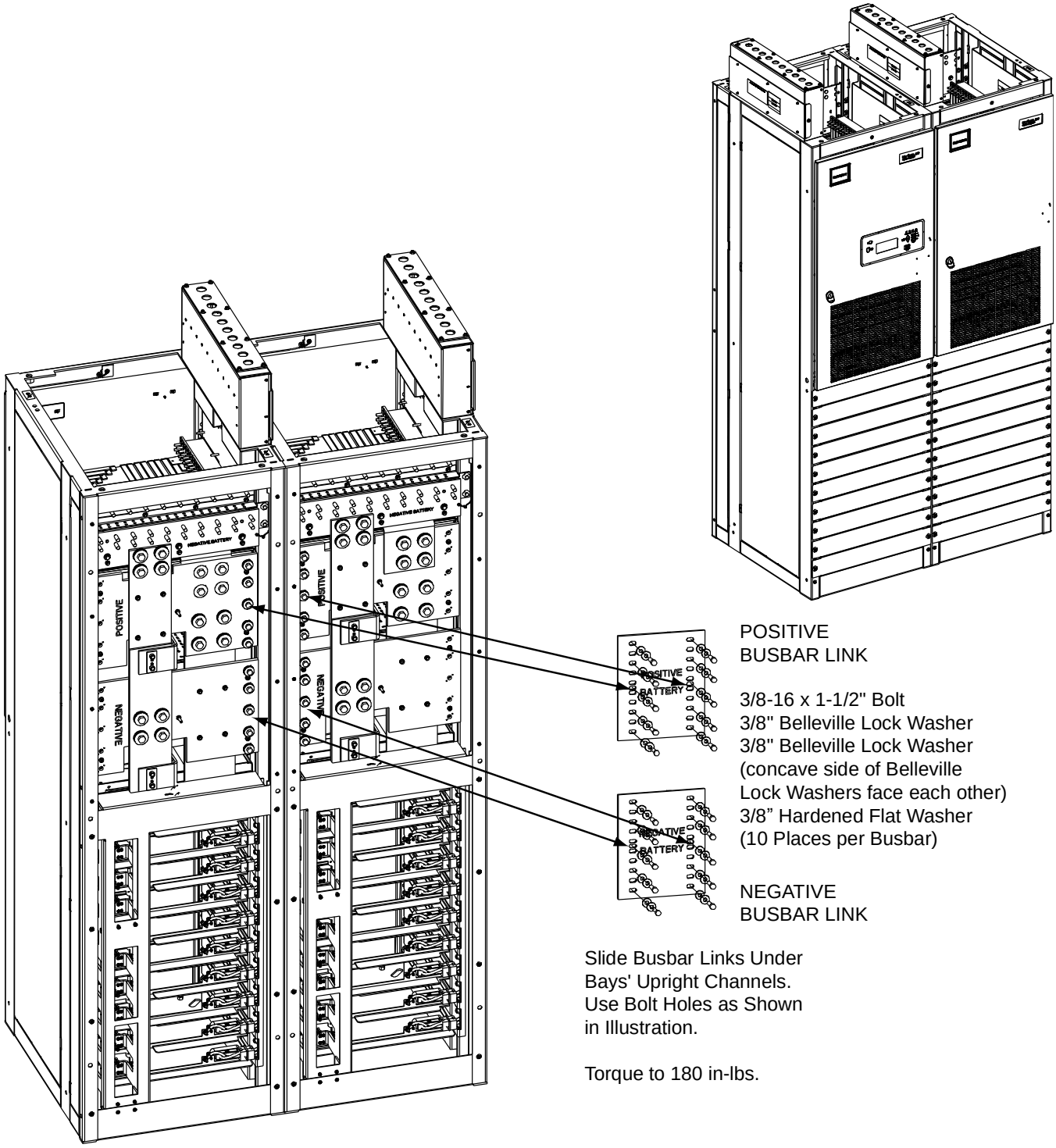
Installing Power/Distribution Bay to Power/Distribution Bay Negative and Positive Busbar Links (WITHOUT PDSC)



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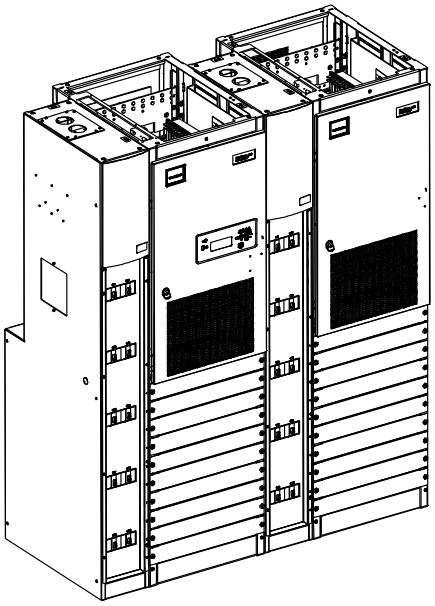
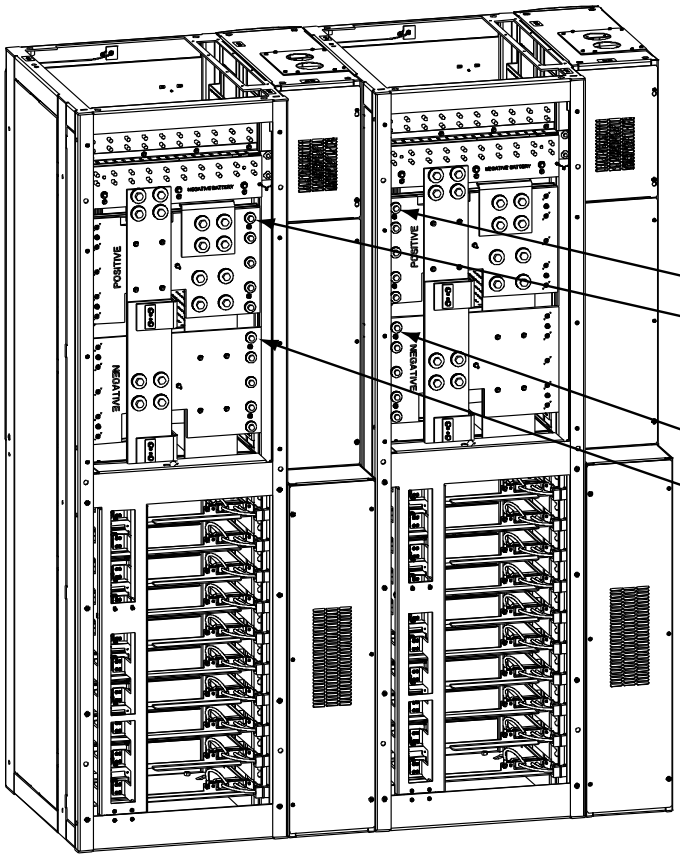
Installing Power/Distribution Bay to Power/Distribution Bay Negative and Positive Busbar Links (WITH PDSC)





POSITIVE
BUSBAR LINK

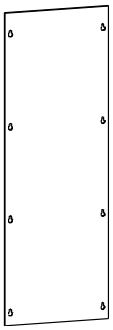
3/8-16 x 1-1/2" Bolt
3/8" Belleville Lock Washer
3/8" Belleville Lock Washer
(concave side of Belleville
Lock Washers face each other)
3/8" Hardened Flat Washer
(10 Places per Busbar)

NEGATIVE
BUSBAR LINK

Slide Busbar Links Under
Bays' Upright Channels.
Use Bolt Holes as Shown
in Illustration.

Torque to 180 in-lbs.

Busbar Link
Cover Shield
(installed after
all mounting
and electrical
connection
procedures
are completed)



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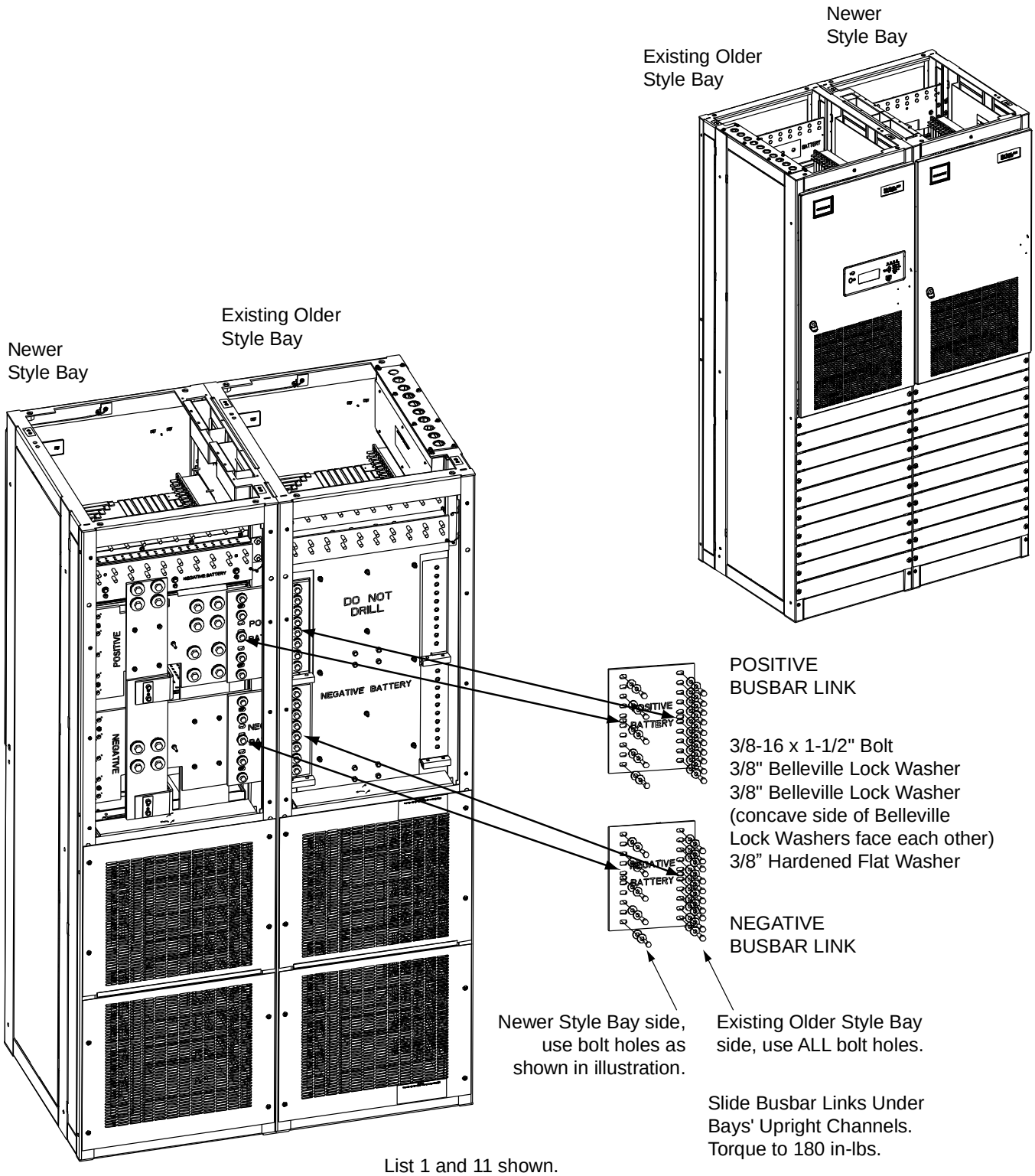
Installing Power/Distribution Bay to Power/Distribution Bay
Negative and Positive Busbar Links – New Style Bay Connected to an Existing Older Style Bay



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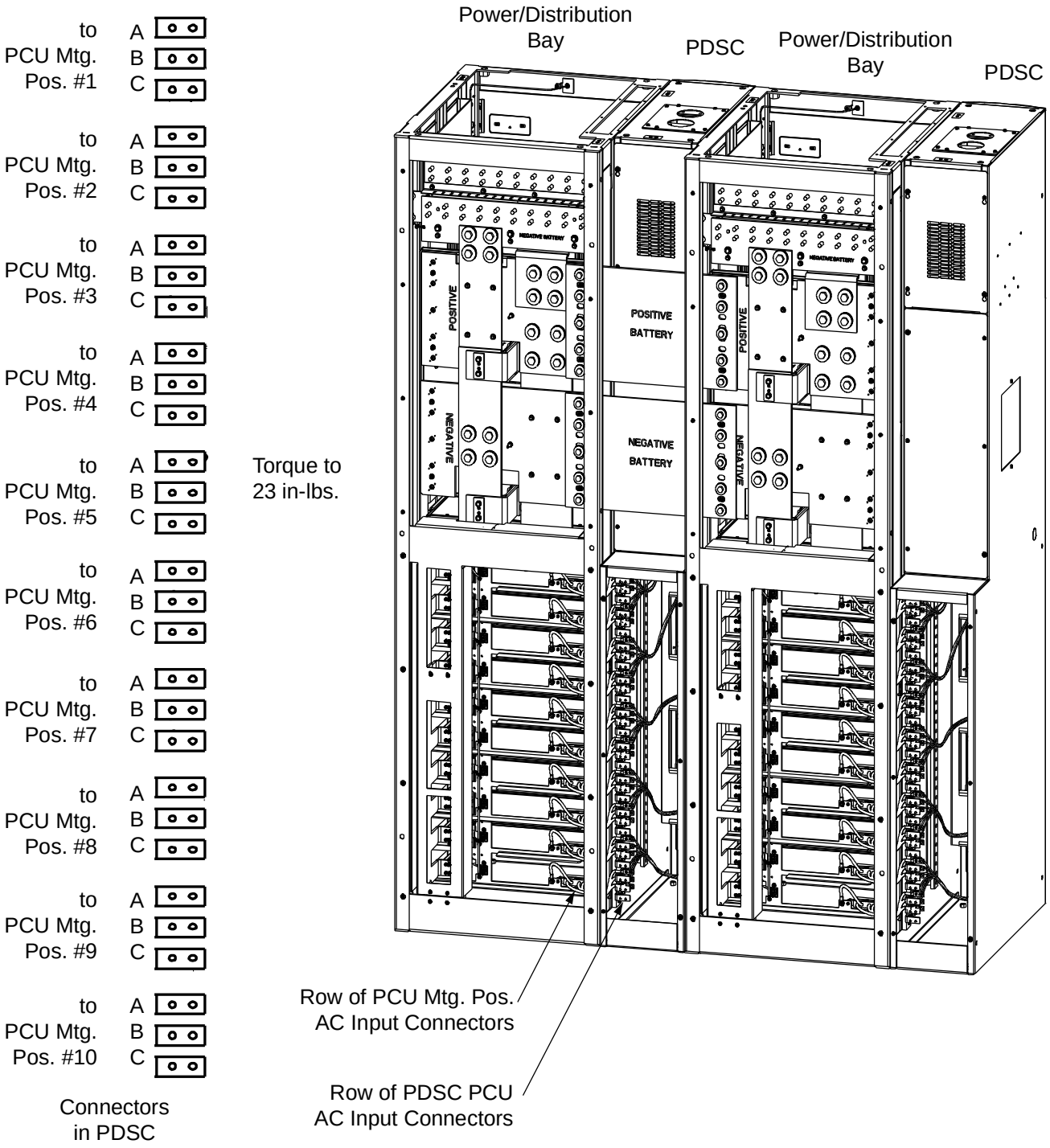
Connecting Rectifier Mounting Position AC Input Connectors to PDSC (Lists 2 and 12 Only)



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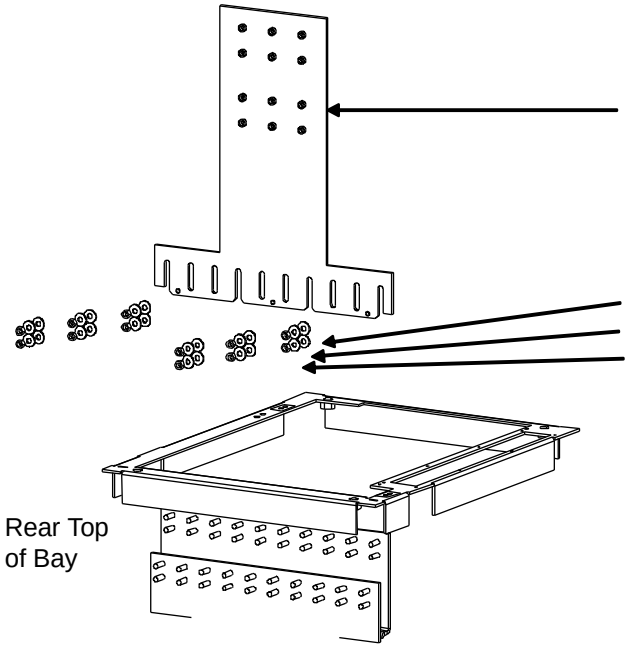
Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 1

STEP 1

Install "Main Positive Busbar" onto Bay's Positive Busbar. Hand-tighten hardware.



(1) Main Positive Busbar, P/N 554877

Note: Apply Electrical Anti-Oxidation Compound to Busbar Mating Surfaces.

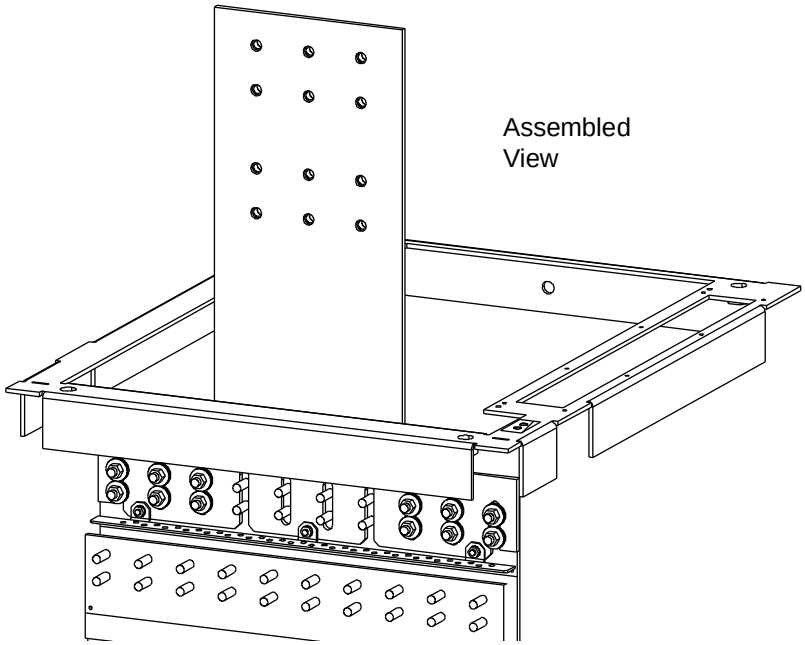
(12) 3/8" Flat Washer, P/N 214204100
(12) 3/8" Belleville Washer, P/N 214825000
(12) 3/8-16 Hex Nut, P/N 228567100
Hand-tighten.

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Hex Nut.

Belleville Washer install between Hex Nut and Flat Washer.

Do the following first before assembly:

1. Remove 552402 (1) and 116638 (4) from Bay.
2. Mount 554880 to the 554877 with 116638 (3).



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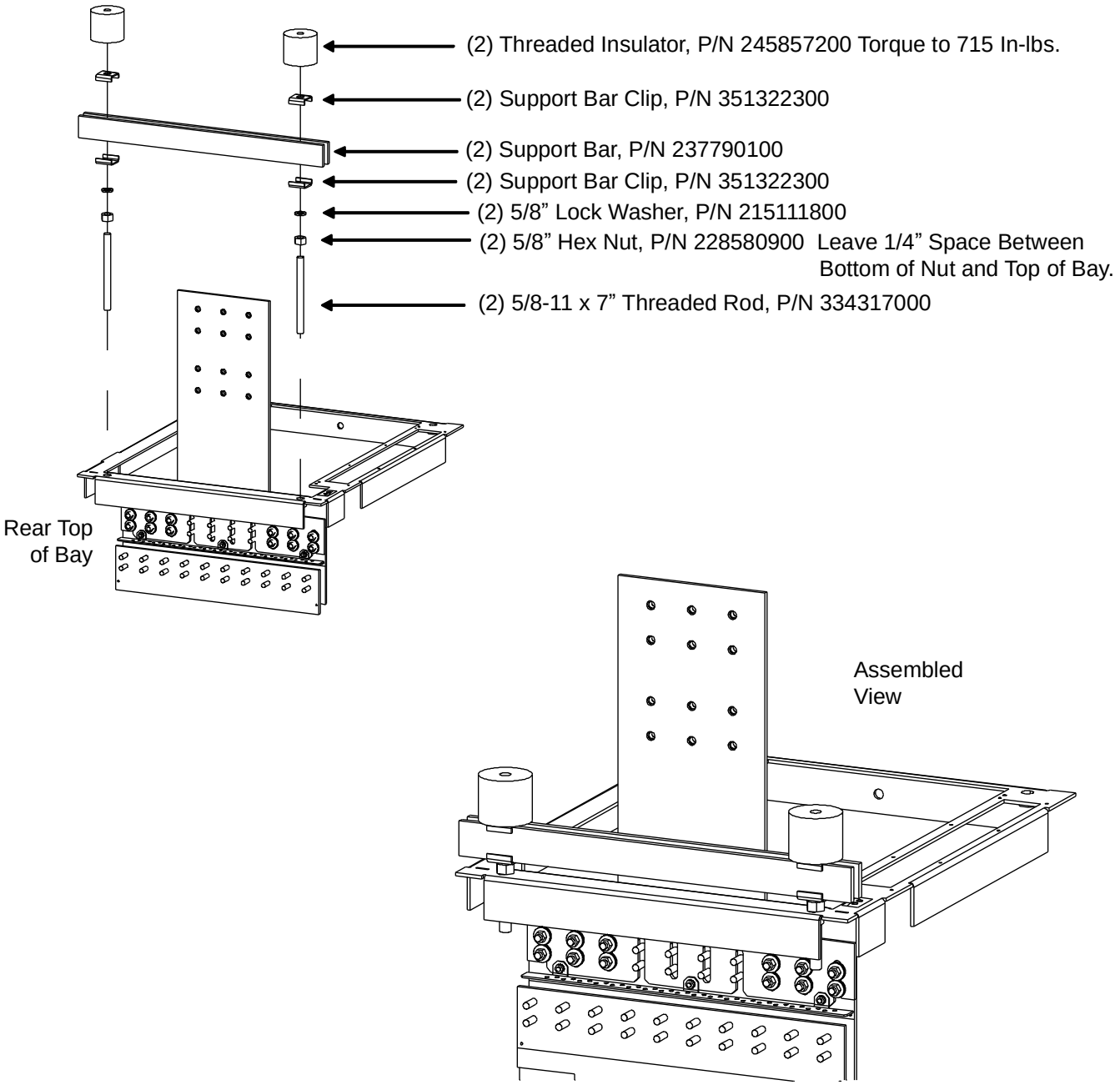
Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 2

STEP 2

Install “Support Bar” and “Related Hardware” onto Top of Bay.


(2) Threaded Insulator, P/N 245857200 Torque to 715 In-lbs.
(2) Support Bar Clip, P/N 351322300
(2) Support Bar, P/N 237790100
(2) Support Bar Clip, P/N 351322300
(2) 5/8” Lock Washer, P/N 215111800
(2) 5/8” Hex Nut, P/N 228580900 Leave 1/4” Space Between Bottom of Nut and Top of Bay.
(2) 5/8-11 x 7” Threaded Rod, P/N 334317000
Rear Top of Bay
Assembled View

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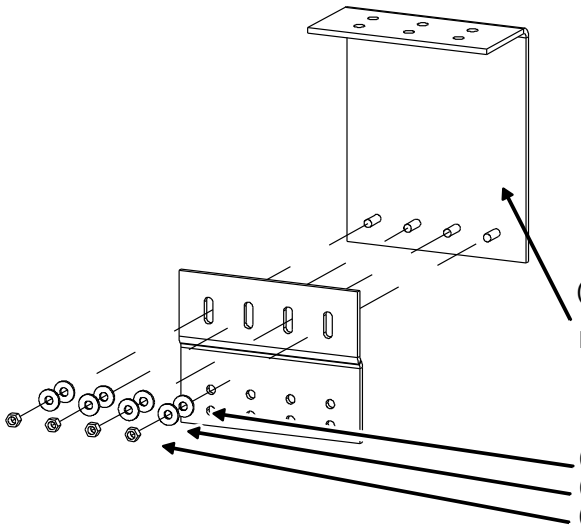
Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 3



STEP 3
Install “Main Negative Busbar” onto Bay’s Negative Busbar. Hand-tighten hardware.

(1) Main Negative Busbar, P/N 554875

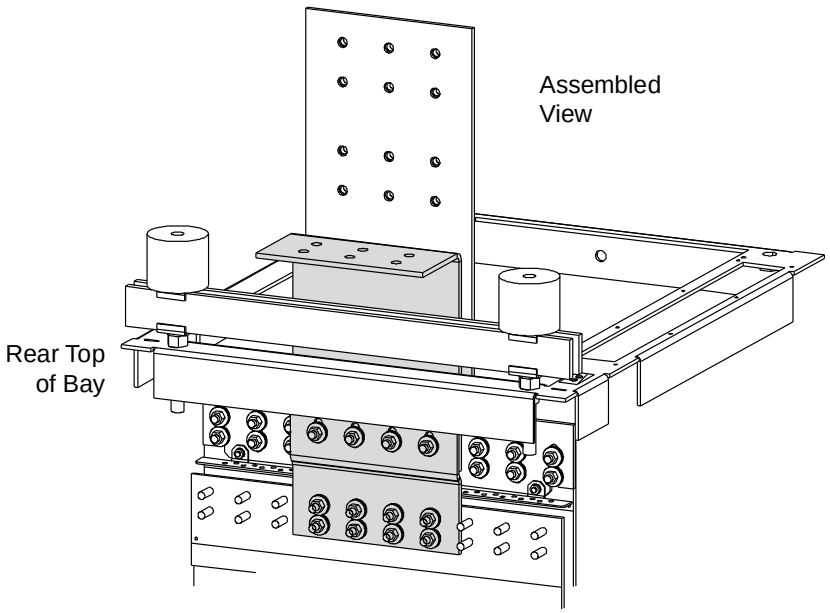
Note: Apply Electrical Anti-Oxidation Compound to Busbar Mating Surfaces.

(8) 3/8” Flat Washer, P/N 214204100
(8) 3/8” Belleville Washer, P/N 214825000
(8) 3/8-16 Hex Nut, P/N 228567100 Hand-Tighten

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Hex Nut.

Belleville Washer Install between Hext Nut and Flat Washer.

Mount 554876 to the 554875.
Hardware:
214204100 (4)
214825000 (4)
228567100 (4)



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Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 4

STEP 4

Install “Horizontal Landing Negative Busbar” onto “Main Negative Busbar”.

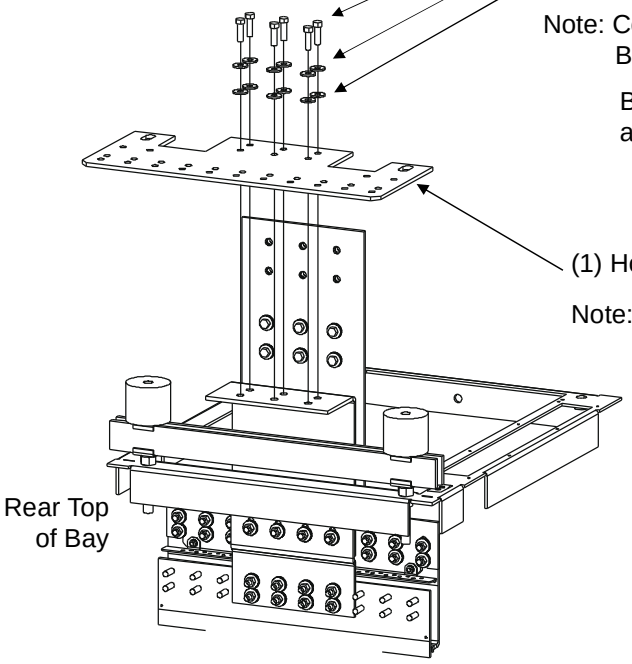
(6) 3/8-16 x 1-1/4” Bolt, P/N 227646800 Torque to 180 in-lbs.
(6) 3/8” Belleville Washer, P/N 214825000
(6) 3/8" Flat Washer, P/N 214204100

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt Head.

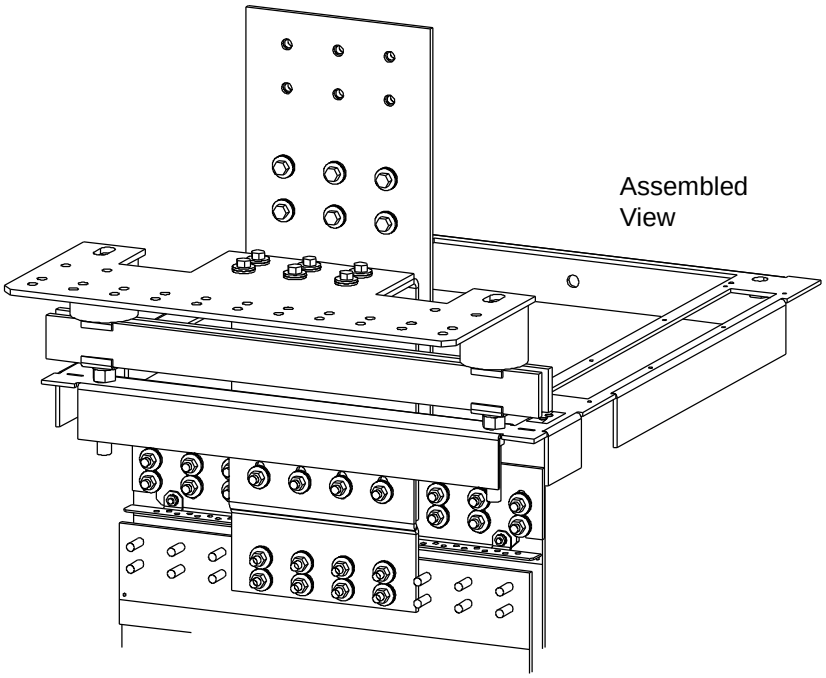
Belleville Washer install between Bolt Head and Flat Washer.

(1) Horizontal Landing Negative Busbar, P/N 514434

Note: Apply Electrical Anti-Oxidation Compound to Busbar Mating Surfaces.



Rear Top of Bay



Assembled View

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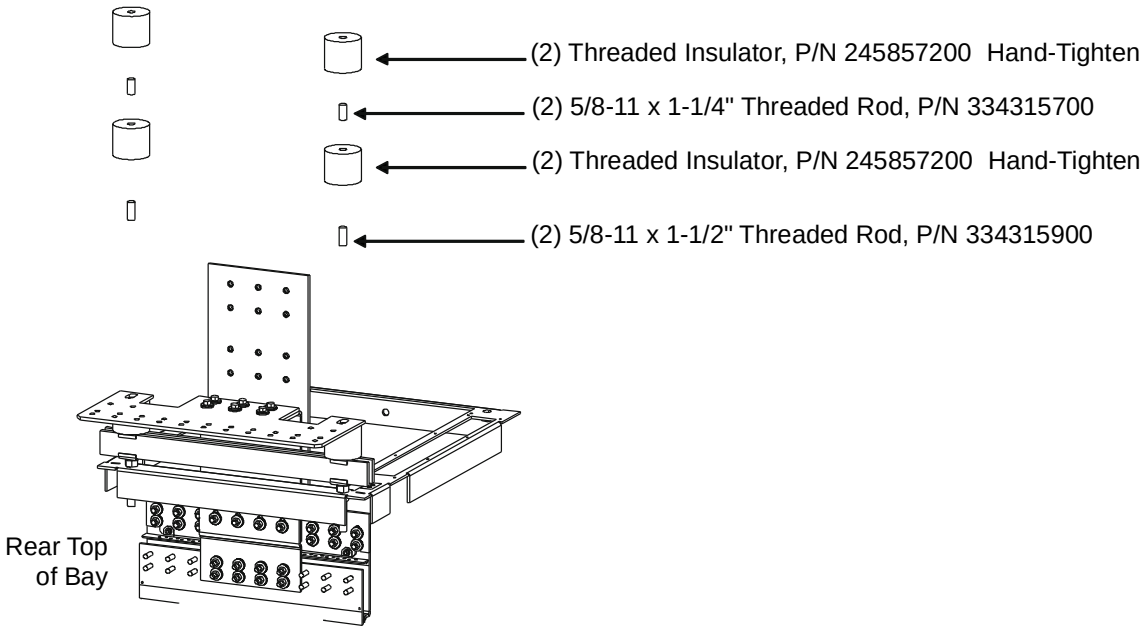
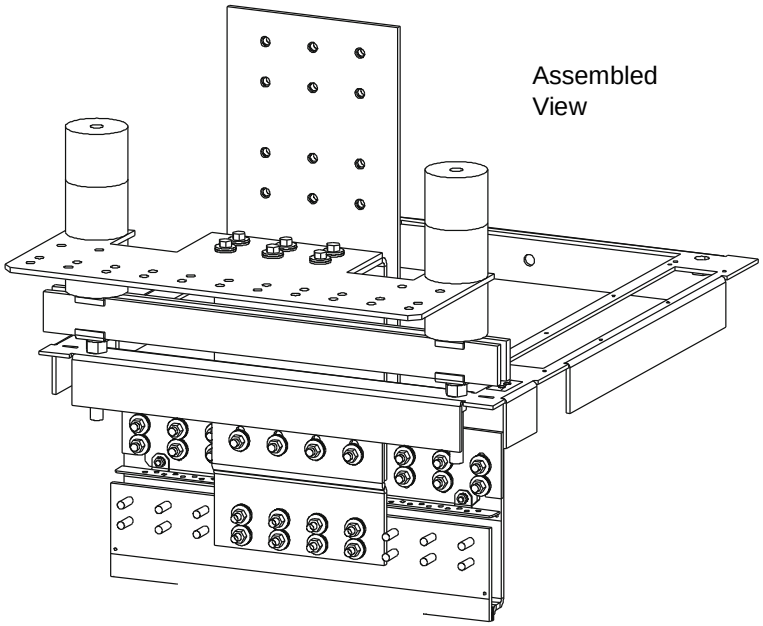
Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 5

STEP 5

Install "Threaded Insulators" onto "Horizontal Landing Negative Busbar".


(2) Threaded Insulator, P/N 245857200 Hand-Tighten
(2) 5/8-11 x 1-1/4" Threaded Rod, P/N 334315700
(2) Threaded Insulator, P/N 245857200 Hand-Tighten
(2) 5/8-11 x 1-1/2" Threaded Rod, P/N 334315900
Rear Top of Bay



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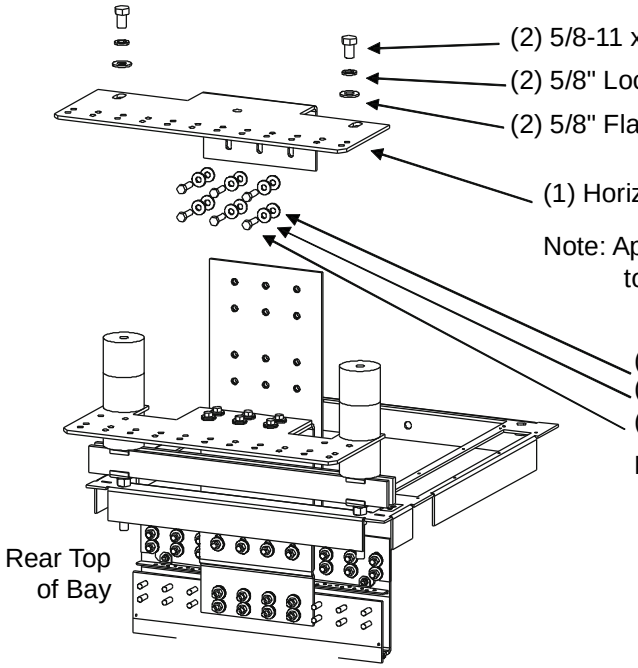
Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 6

STEP 6

Install "Horizontal Landing Positive Busbar" onto "Main Positive Busbar".



(2) 5/8-11 x 1" Bolt, P/N 227655100 Torque to 715 in-lbs.
(2) 5/8" Lock Washer, P/N 215111800
(2) 5/8" Flat Washer, P/N 214201300

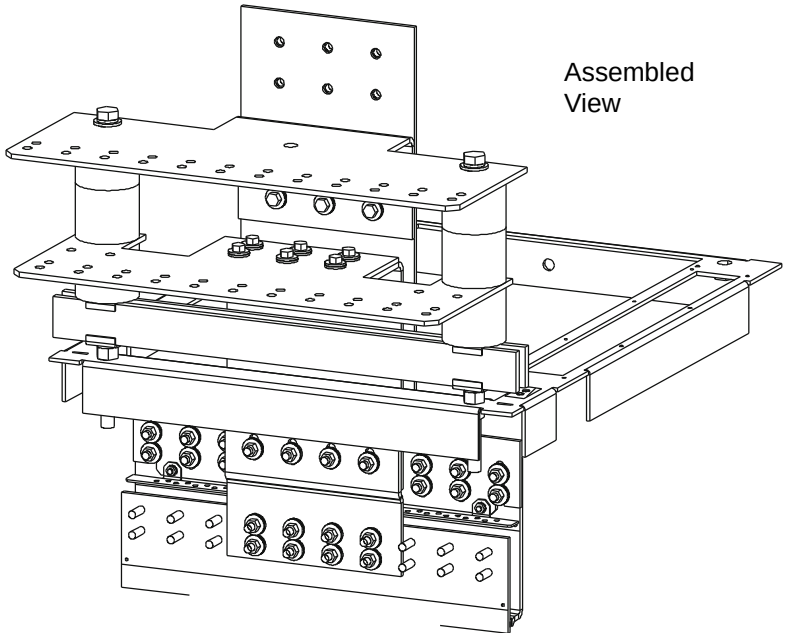
(1) Horizontal Landing Positive Busbar, P/N 514436

Note: Apply Electrical Anti-Oxidation Compound to Busbar Mating Surfaces.

(6) 3/8" Flat Washer, P/N 214204100 Torque to 180 in-lbs.
(6) 3/8" Belleville Washer, P/N 214825000
(6) 3/8-16 x 1-1/4" Bolt, P/N 227646800

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt Head.

Belleville Washer install between Bolt Head and Flat Washer.



Assembled View

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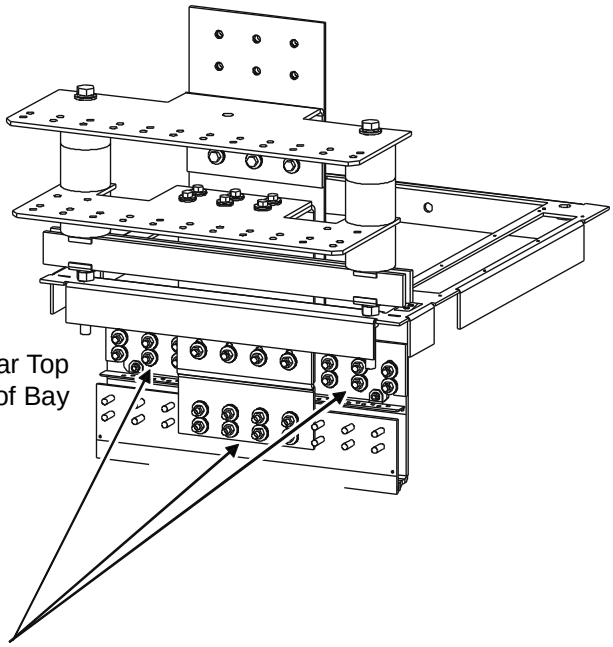
Power/Distribution Bay
External Top-Mount Horizontal Battery Input Busbar Assembly (P/N 554873)
Assembly Procedure Step 7

STEP 7
Final Torque



Torque these connections
to 180 in-lbs (20 places).

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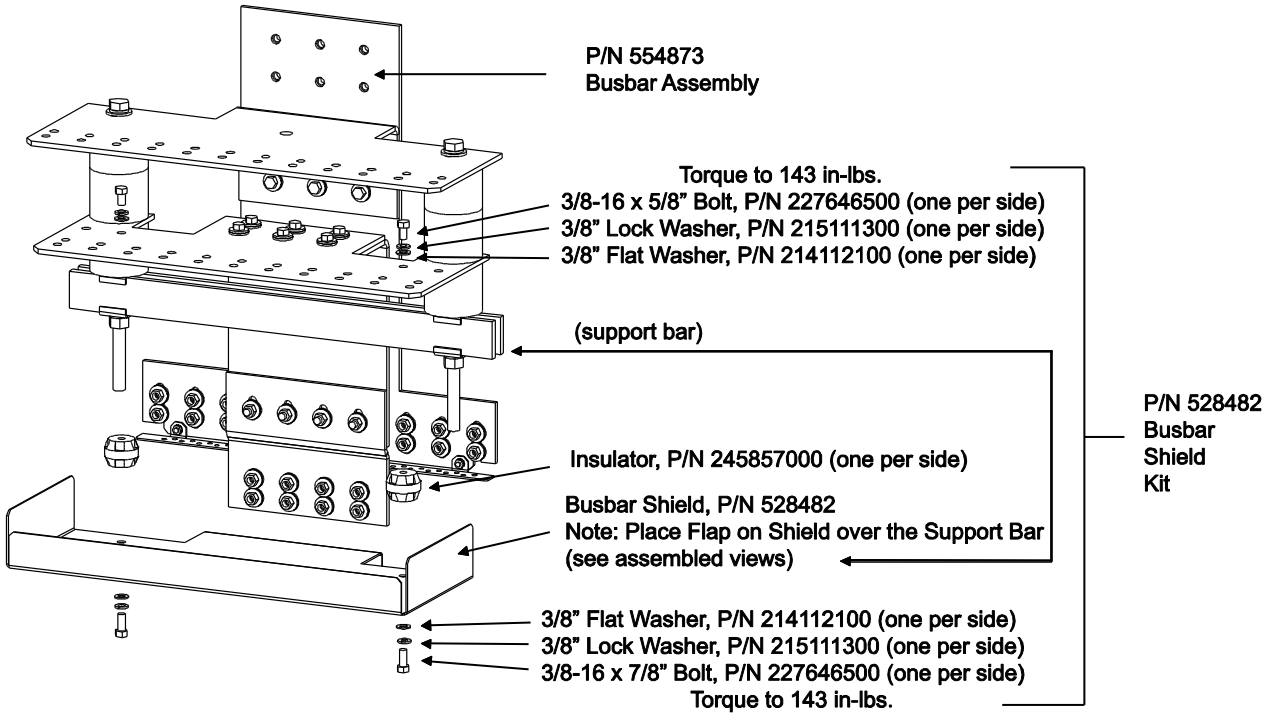
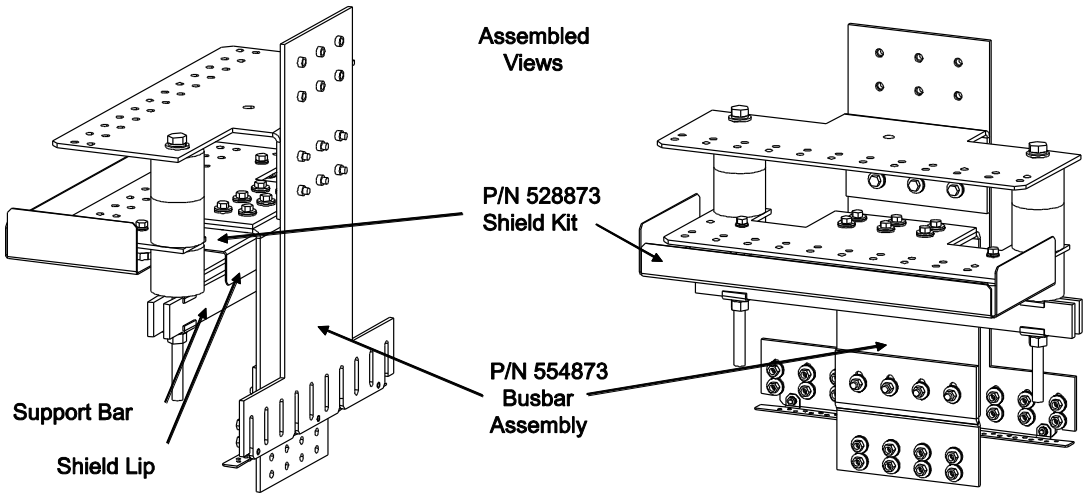
Power/Distribution Bay
Busbar Shield Kit (P/N 528482)
Assembly Procedure


P/N 554873
Busbar Assembly
Torque to 143 in-lbs.
3/8-16 x 5/8" Bolt, P/N 227646500 (one per side)
3/8" Lock Washer, P/N 215111300 (one per side)
3/8" Flat Washer, P/N 214112100 (one per side)
(support bar)
Insulator, P/N 245857000 (one per side)
Busbar Shield, P/N 528482
Note: Place Flap on Shield over the Support Bar
(see assembled views)
3/8" Flat Washer, P/N 214112100 (one per side)
3/8" Lock Washer, P/N 215111300 (one per side)
3/8-16 x 7/8" Bolt, P/N 227646500 (one per side)
Torque to 143 in-lbs.
P/N 528482
Busbar
Shield
Kit



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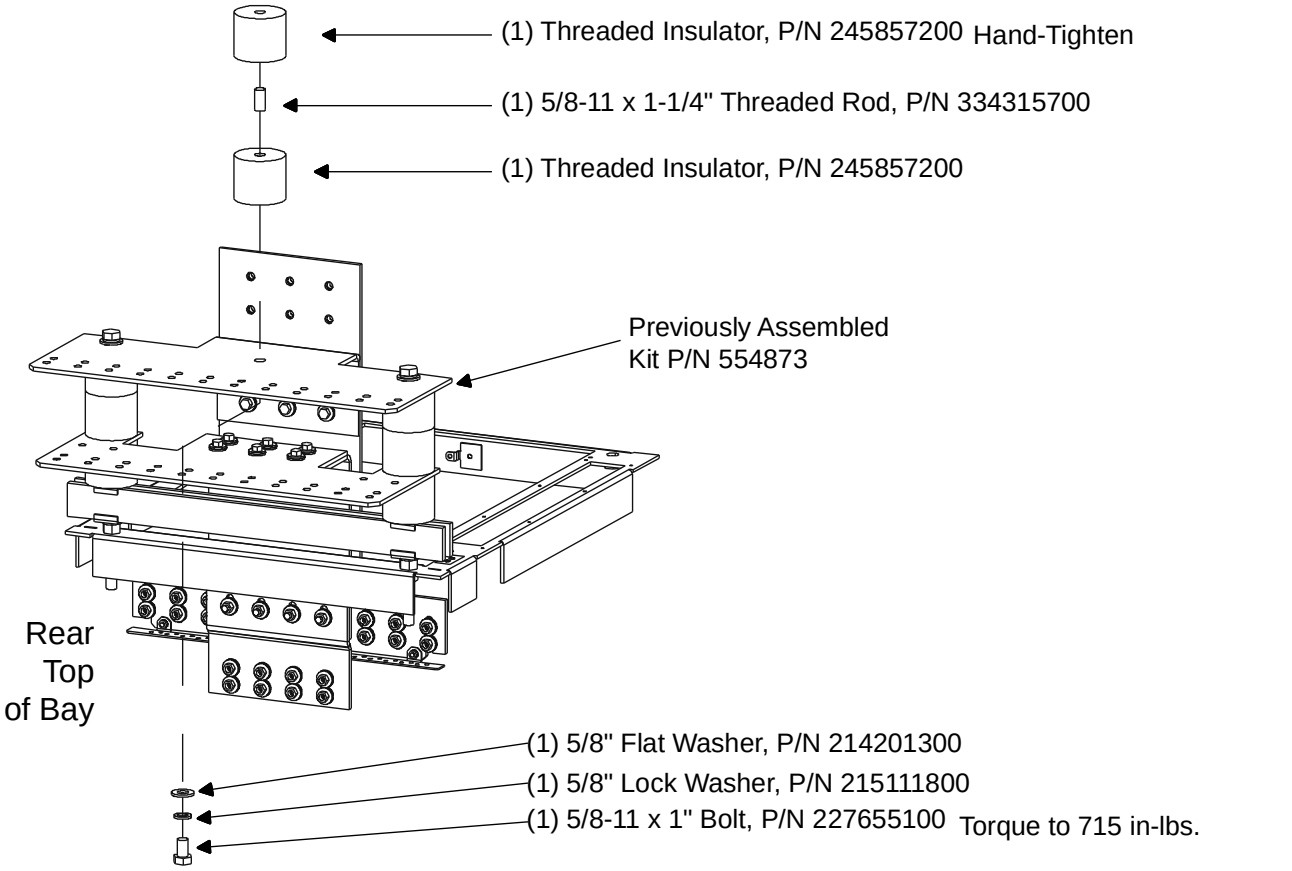
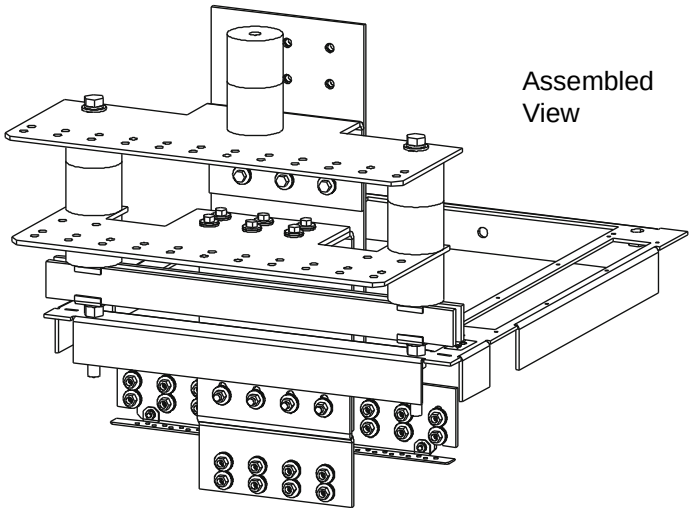
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514688 or 514689)
Assembly Procedure Step 1

STEP 1
Install "Threaded Insulators".


(1) Threaded Insulator, P/N 245857200 Hand-Tighten
(1) 5/8-11 x 1-1/4" Threaded Rod, P/N 334315700
(1) Threaded Insulator, P/N 245857200
Previously Assembled
Kit P/N 554873
Rear
Top
of Bay
(1) 5/8" Flat Washer, P/N 214201300
(1) 5/8" Lock Washer, P/N 215111800
(1) 5/8-11 x 1" Bolt, P/N 227655100 Torque to 715 in-lbs.



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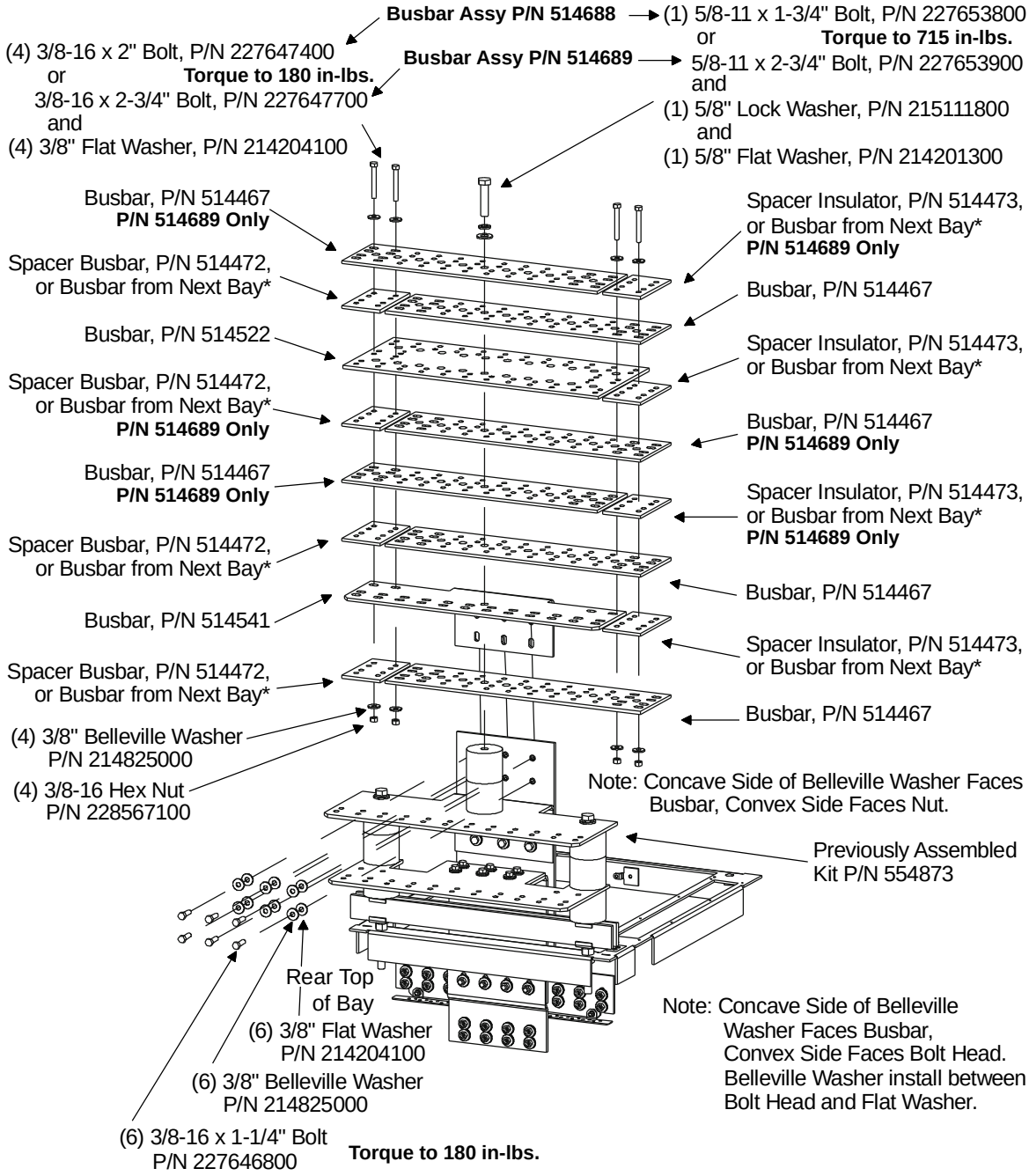
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514688 or 514689)
Assembly Procedure Step 2A

STEP 2A

Install "Busbars".
(see Step 2B for Bolt Hole Identification)
(see Step 2C for Assembled View)

* Use "Spacer Busbars" or "Spacer Insulators" on end bays or stand-alone bays. For multiple bays, 'sandwich' busbars of adjacent "Busbar Assemblies" together.

Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.


Busbar Assy P/N 514688
(1) 5/8-11 x 1-3/4" Bolt, P/N 227653800
or
Torque to 715 in-lbs.
Busbar Assy P/N 514689
5/8-11 x 2-3/4" Bolt, P/N 227653900
and
(1) 5/8" Lock Washer, P/N 215111800
and
(1) 5/8" Flat Washer, P/N 214201300
(4) 3/8-16 x 2" Bolt, P/N 227647400
or
Torque to 180 in-lbs.
3/8-16 x 2-3/4" Bolt, P/N 227647700
and
(4) 3/8" Flat Washer, P/N 214204100
Busbar, P/N 514467
P/N 514689 Only
Spacer Busbar, P/N 514472,
or Busbar from Next Bay*
Busbar, P/N 514522
Spacer Busbar, P/N 514472,
or Busbar from Next Bay*
P/N 514689 Only
Busbar, P/N 514467
P/N 514689 Only
Spacer Busbar, P/N 514472,
or Busbar from Next Bay*
Busbar, P/N 514541
Spacer Busbar, P/N 514472,
or Busbar from Next Bay*
(4) 3/8" Belleville Washer
P/N 214825000
(4) 3/8-16 Hex Nut
P/N 228567100
Spacer Insulator, P/N 514473,
or Busbar from Next Bay*
P/N 514689 Only
Busbar, P/N 514467
Spacer Insulator, P/N 514473,
or Busbar from Next Bay*
Busbar, P/N 514467
P/N 514689 Only
Spacer Insulator, P/N 514473,
or Busbar from Next Bay*
P/N 514689 Only
Busbar, P/N 514467
Spacer Insulator, P/N 514473,
or Busbar from Next Bay*
Busbar, P/N 514467
Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Nut.
Previously Assembled
Kit P/N 554873
Rear Top
of Bay
(6) 3/8" Flat Washer
P/N 214204100
(6) 3/8" Belleville Washer
P/N 214825000
(6) 3/8-16 x 1-1/4" Bolt
P/N 227646800
Torque to 180 in-lbs.
Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt Head. Belleville Washer install between Bolt Head and Flat Washer.

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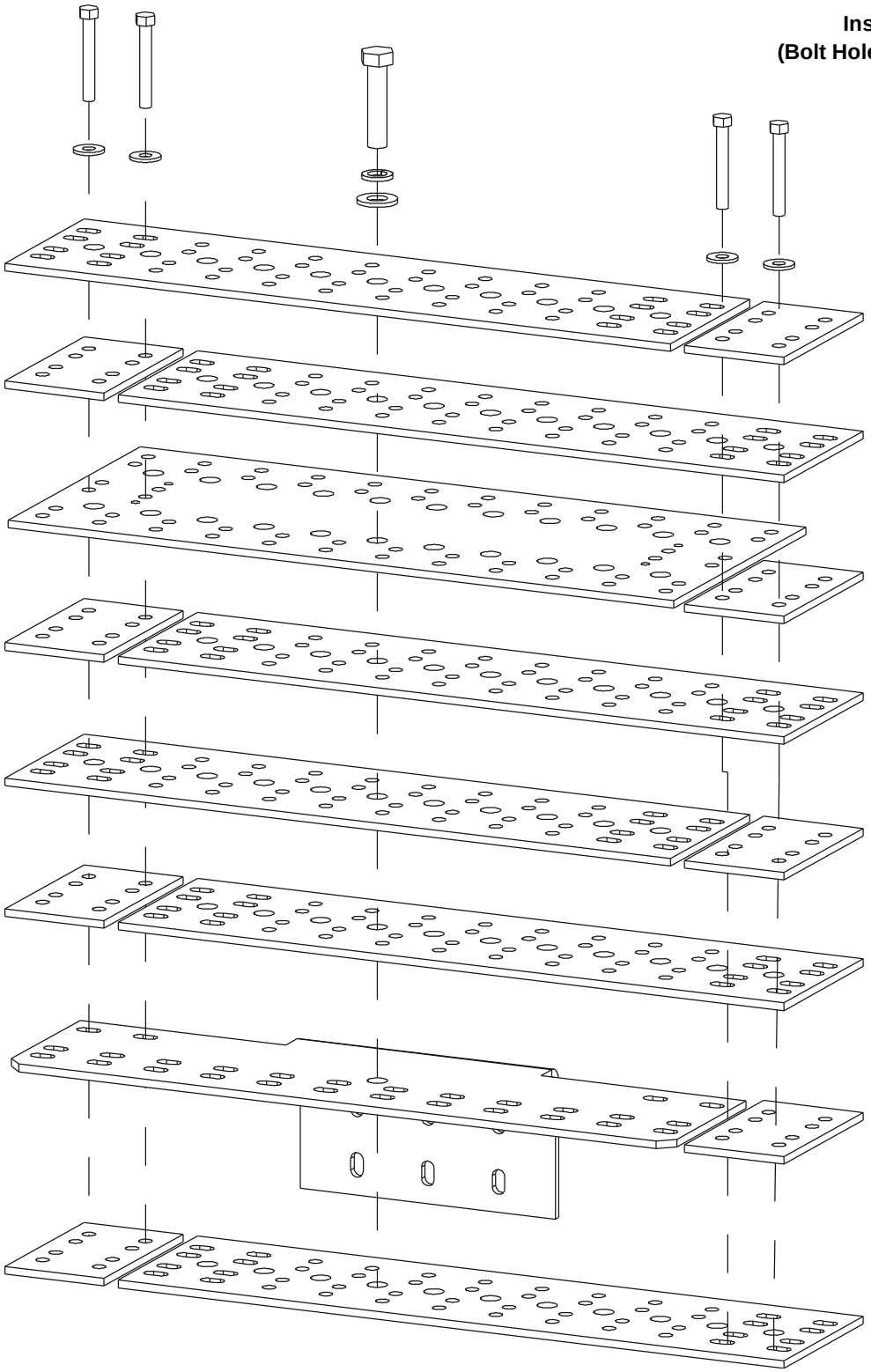
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514688 or 514689)
Assembly Procedure Step 2B

STEP 2B
Install "Busbars".
(Bolt Hole Identification)



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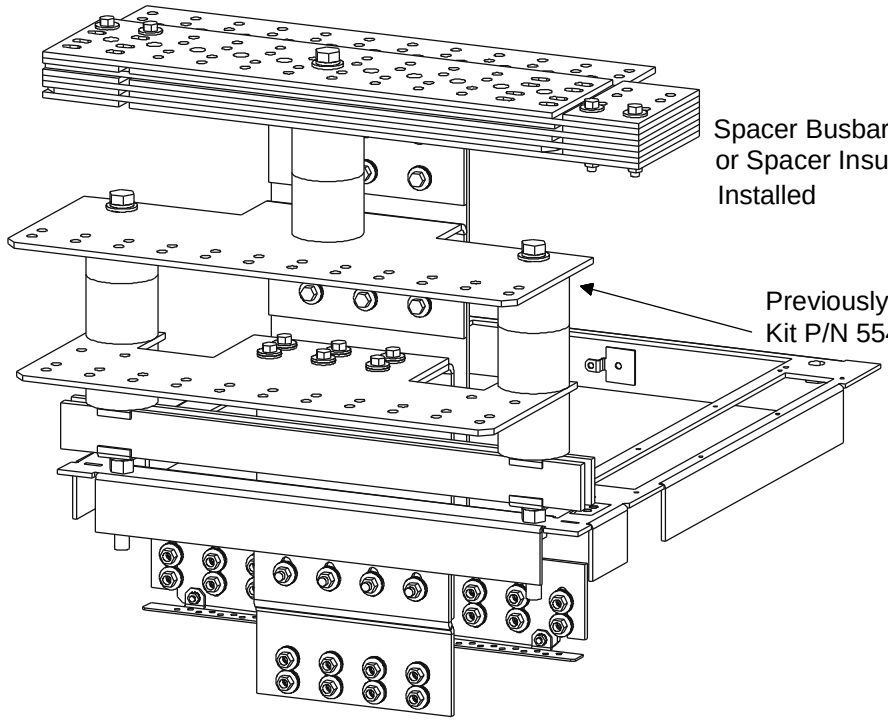
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514688 or 514689)
Assembly Procedure Step 2C

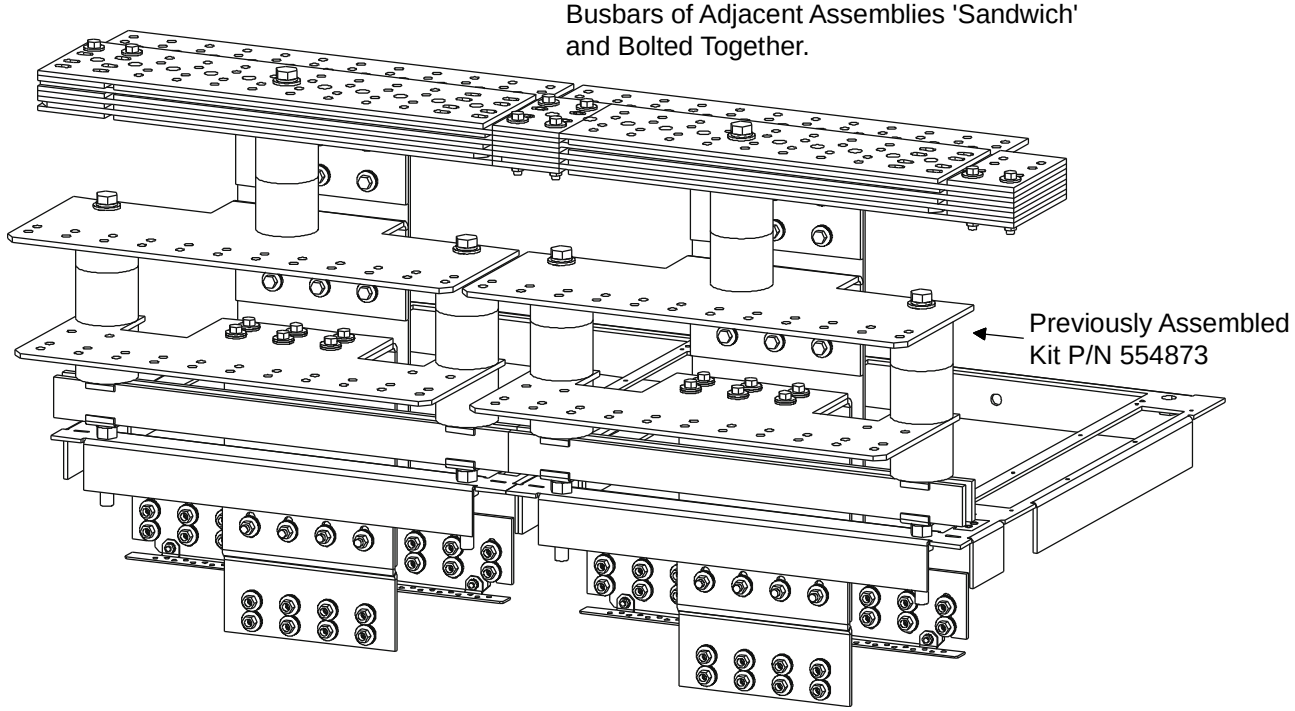
STEP 2C

Install "Busbars".
(Assembled Views)



Assembled
Views

No Spacer Busbars or Spacer Insulators.
Busbars of Adjacent Assemblies 'Sandwich'
and Bolted Together.



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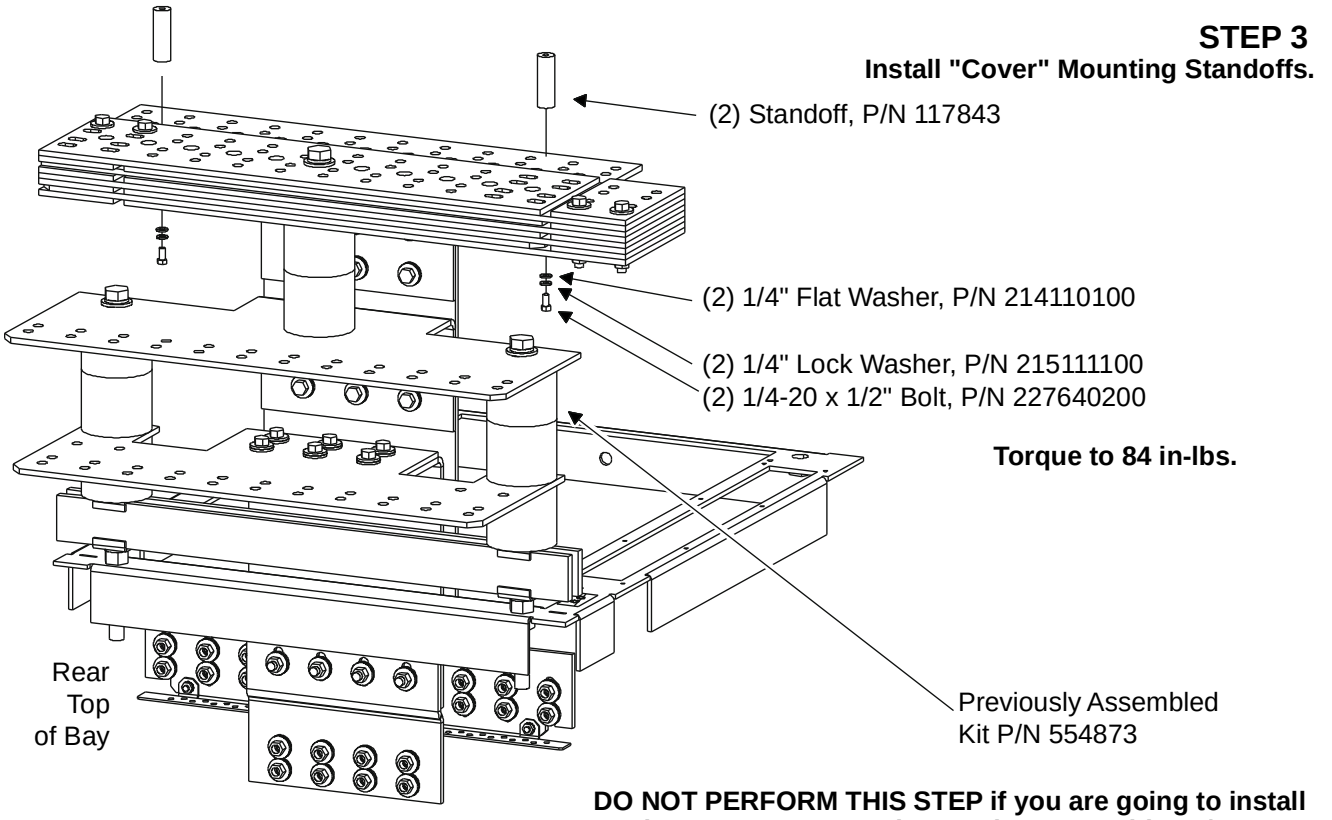
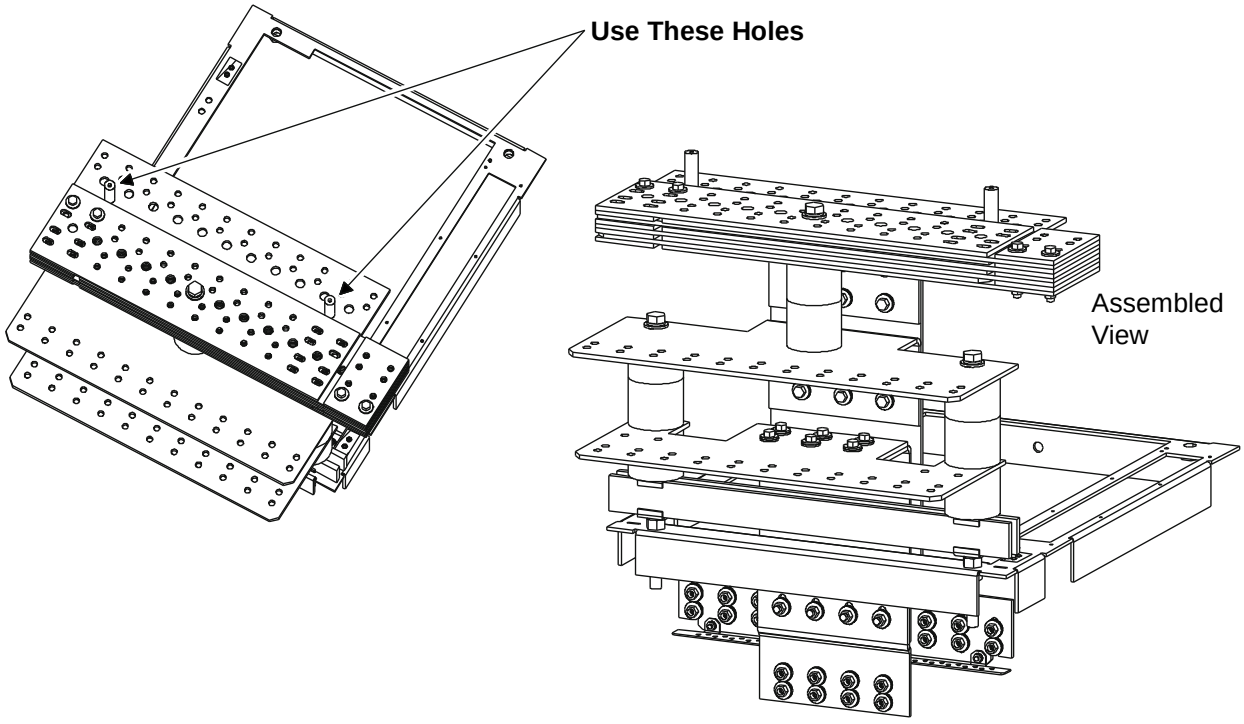
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514688 or 514689)
Assembly Procedure Step 3



DO NOT PERFORM THIS STEP if you are going to install "Load Return Lug Extension Busbar Assembly" P/N 514543



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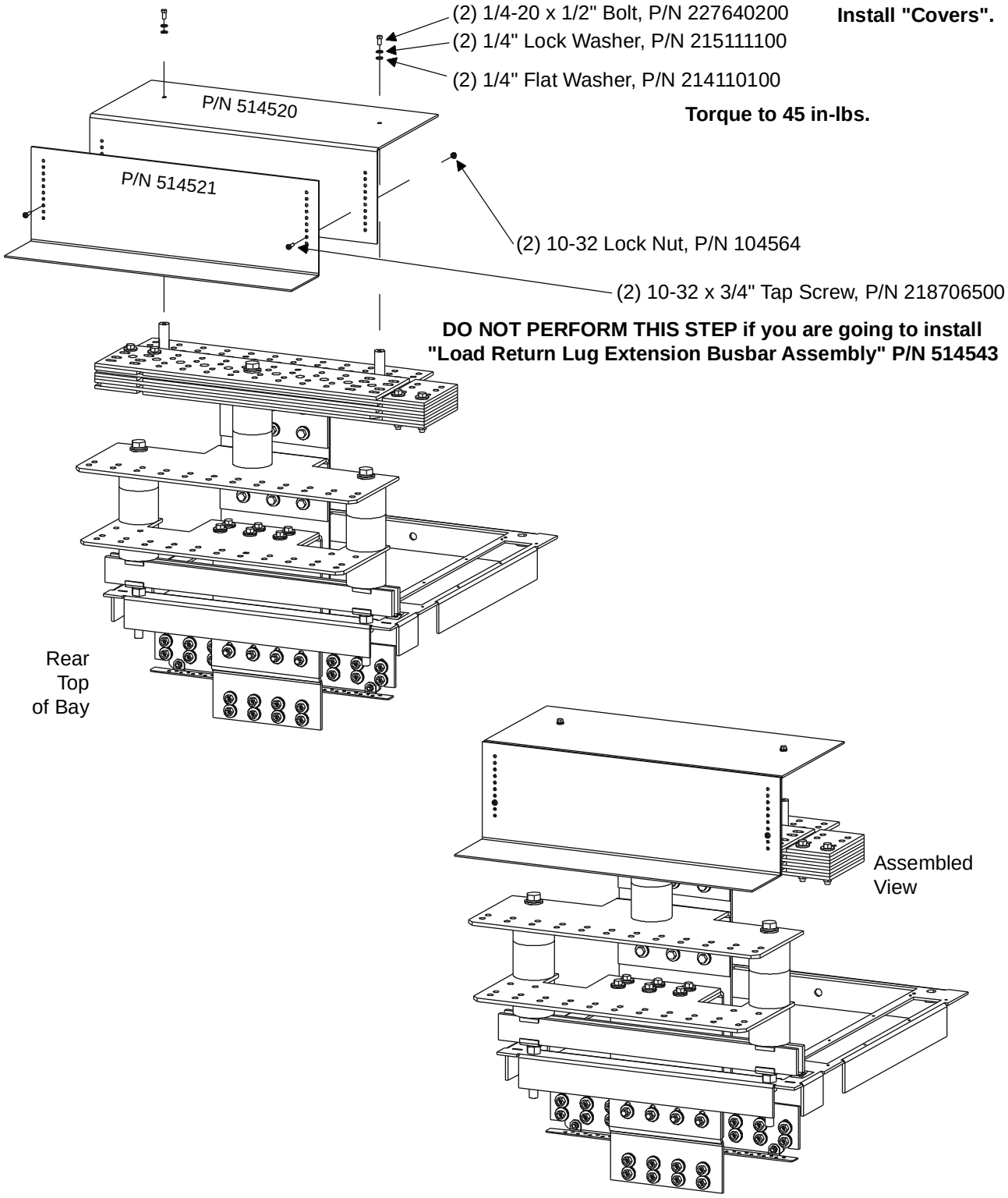
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514688 or 514689)
Assembly Procedure Step 4

STEP 4
Install "Covers".


(2) 1/4-20 x 1/2" Bolt, P/N 227640200
(2) 1/4" Lock Washer, P/N 215111100
(2) 1/4" Flat Washer, P/N 214110100
Torque to 45 in-lbs.
P/N 514520
P/N 514521
(2) 10-32 Lock Nut, P/N 104564
(2) 10-32 x 3/4" Tap Screw, P/N 218706500
DO NOT PERFORM THIS STEP if you are going to install
"Load Return Lug Extension Busbar Assembly" P/N 514543
Rear
Top
of Bay
Assembled
View

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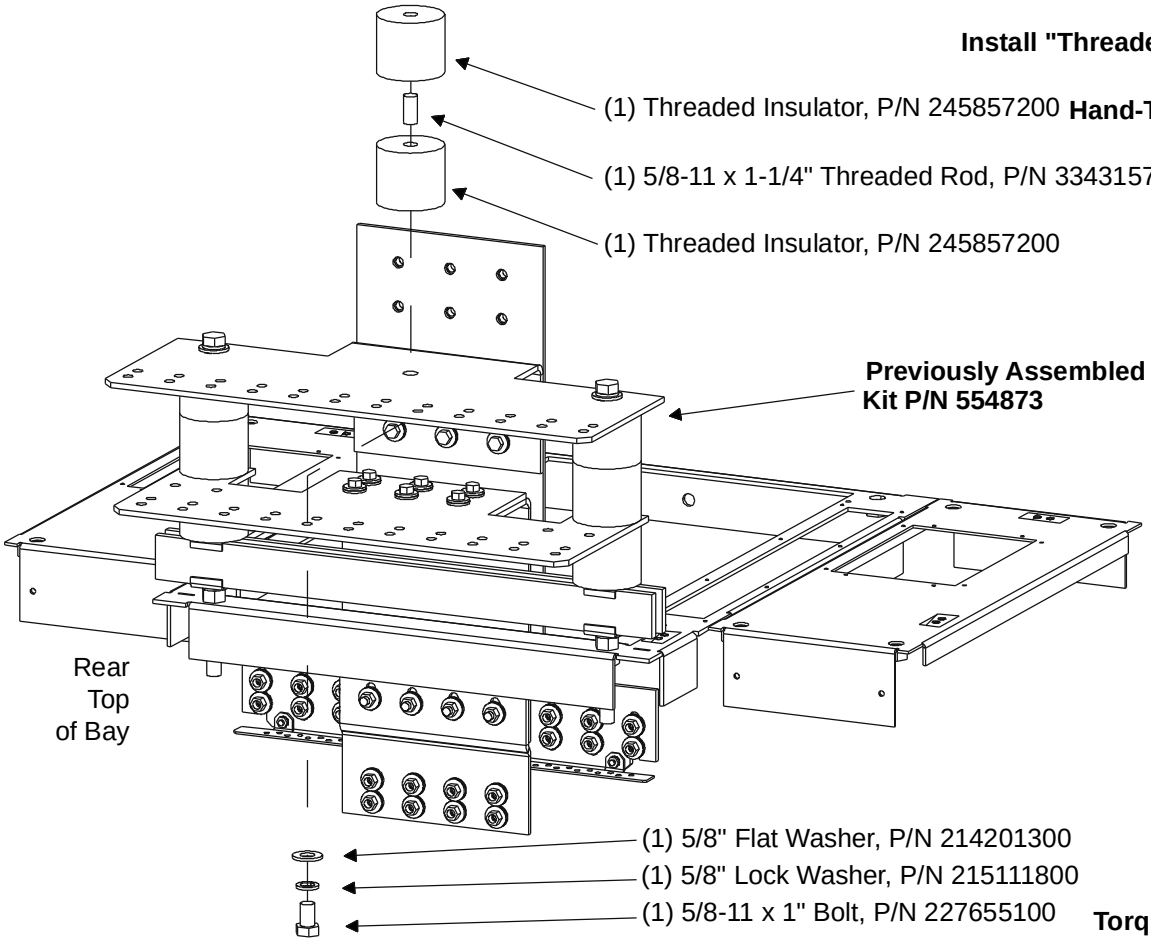
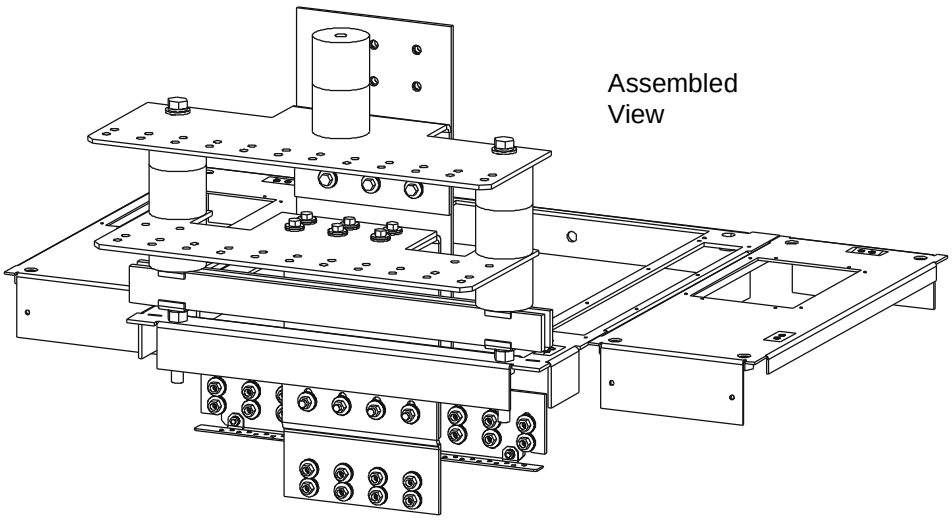
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514690 or 514691)
Assembly Procedure Step 1

STEP 1
Install "Threaded Insulators".


(1) Threaded Insulator, P/N 245857200 **Hand-Tighten**
(1) 5/8-11 x 1-1/4" Threaded Rod, P/N 334315700
(1) Threaded Insulator, P/N 245857200
Previously Assembled Kit P/N 554873
Rear Top of Bay
(1) 5/8" Flat Washer, P/N 214201300
(1) 5/8" Lock Washer, P/N 215111800
(1) 5/8-11 x 1" Bolt, P/N 227655100 **Torque to 715 in-lbs.**



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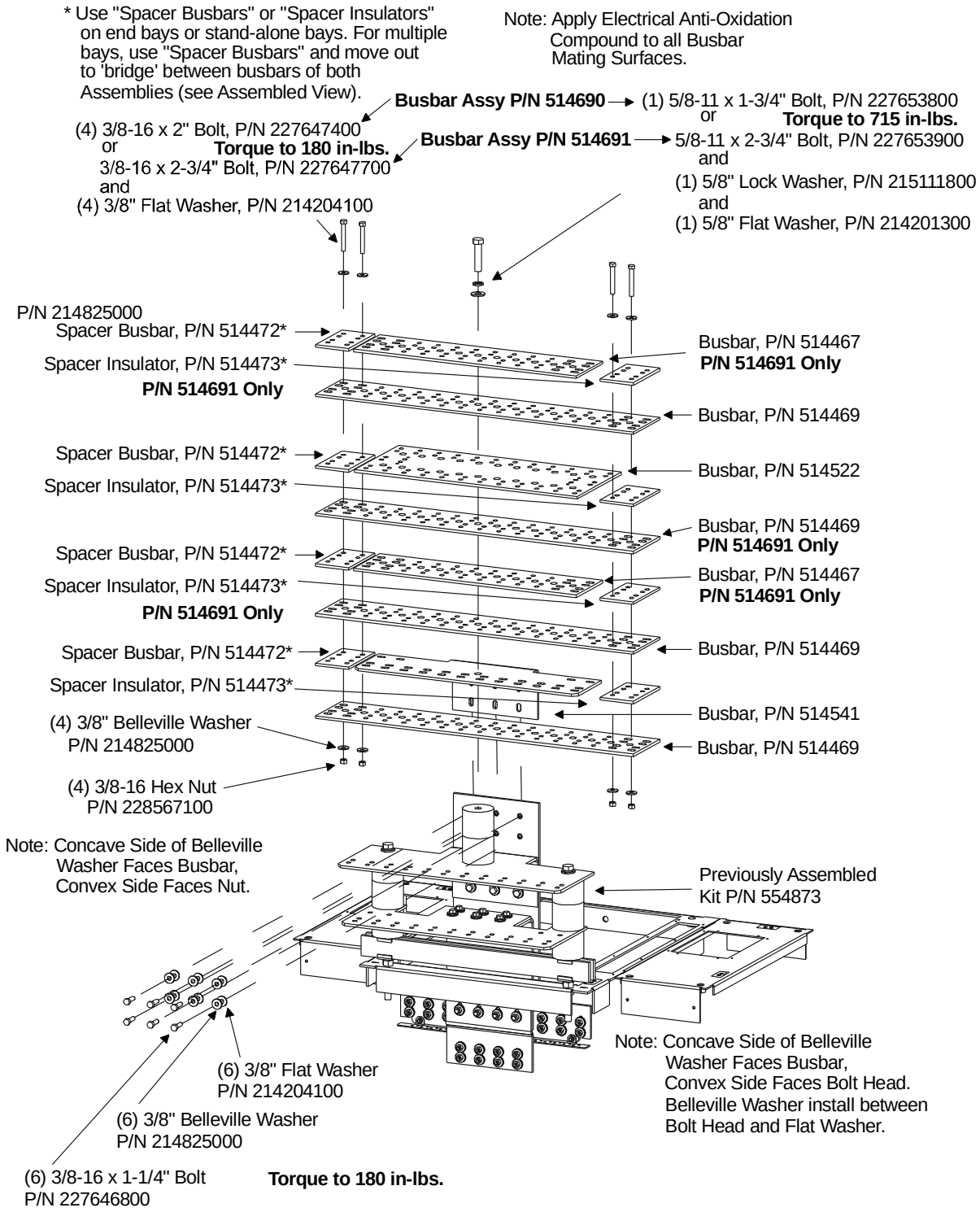
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514690 or 514691)
Assembly Procedure Step 2A

STEP 2A
Install "Busbars".
(see Step 2B for Bolt Hole Identification)
(see Step 2C for Assembled View)


* Use "Spacer Busbars" or "Spacer Insulators" on end bays or stand-alone bays. For multiple bays, use "Spacer Busbars" and move out to 'bridge' between busbars of both Assemblies (see Assembled View).
Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.
Busbar Assy P/N 514690
(1) 5/8-11 x 1-3/4" Bolt, P/N 227653800
or
Torque to 715 in-lbs.
(4) 3/8-16 x 2" Bolt, P/N 227647400
or
Torque to 180 in-lbs.
3/8-16 x 2-3/4" Bolt, P/N 227647700
and
(4) 3/8" Flat Washer, P/N 214204100
Busbar Assy P/N 514691
5/8-11 x 2-3/4" Bolt, P/N 227653900
and
(1) 5/8" Lock Washer, P/N 215111800
and
(1) 5/8" Flat Washer, P/N 214201300
P/N 214825000
Spacer Busbar, P/N 514472*
Spacer Insulator, P/N 514473*
P/N 514691 Only
Busbar, P/N 514467
P/N 514691 Only
Busbar, P/N 514469
Busbar, P/N 514522
Busbar, P/N 514469
P/N 514691 Only
Busbar, P/N 514467
P/N 514691 Only
Busbar, P/N 514541
(4) 3/8" Belleville Washer
P/N 214825000
(4) 3/8-16 Hex Nut
P/N 228567100
Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Nut.
Previously Assembled Kit P/N 554873
(6) 3/8" Flat Washer
P/N 214204100
(6) 3/8" Belleville Washer
P/N 214825000
(6) 3/8-16 x 1-1/4" Bolt
P/N 227646800
Torque to 180 in-lbs.
Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt Head. Belleville Washer install between Bolt Head and Flat Washer.

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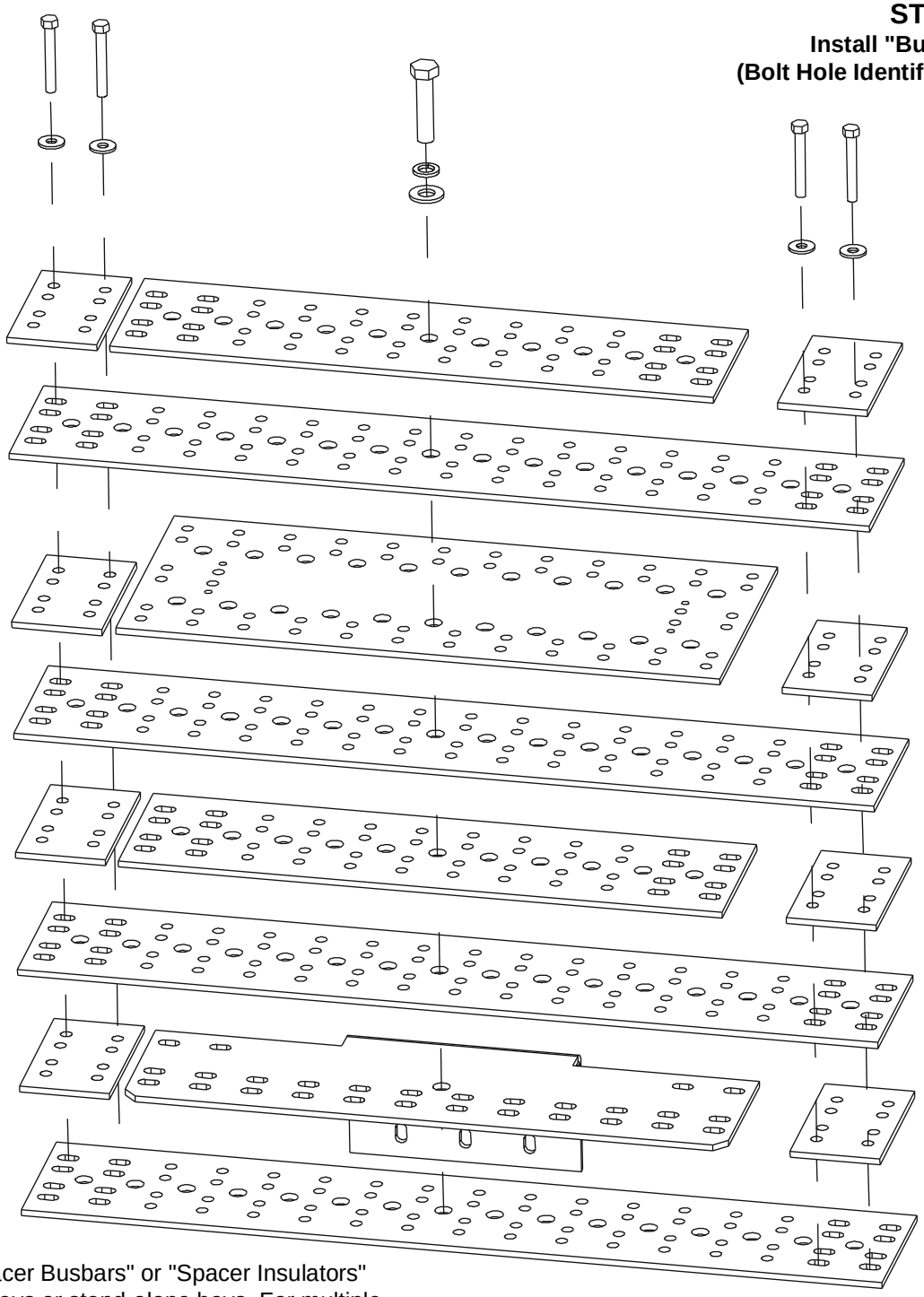
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514690 or 514691)
Assembly Procedure Step 2B

STEP 2B
Install "Busbars".
(Bolt Hole Identification)



* Use "Spacer Busbars" or "Spacer Insulators" on end bays or stand-alone bays. For multiple bays, use "Spacer Busbars" and move out to 'bridge' between busbars of both Assemblies (see Assembled View).

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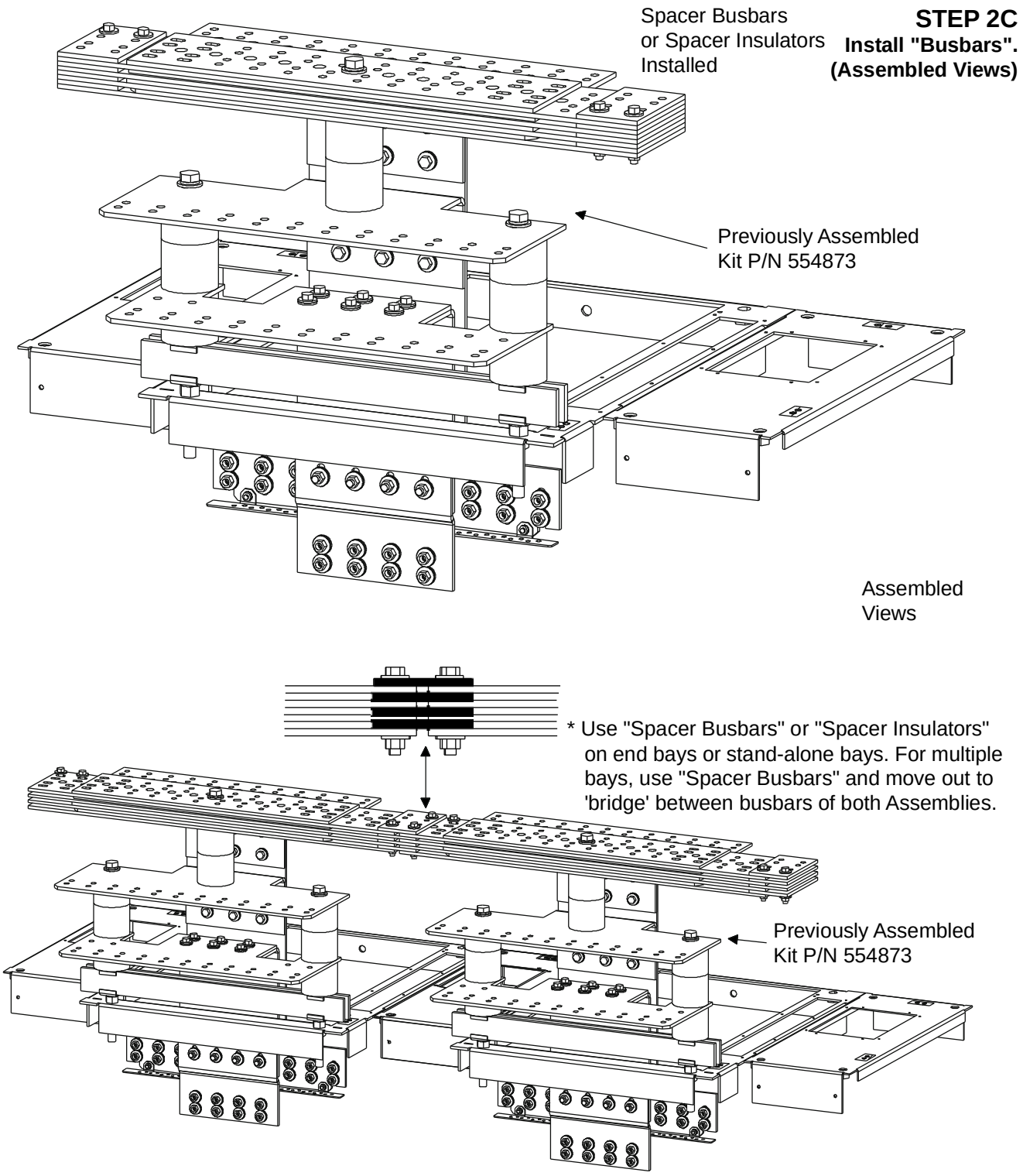
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514690 or 514691)
Assembly Procedure Step 2C


Spacer Busbars
or Spacer Insulators
Installed
STEP 2C
Install "Busbars".
(Assembled Views)
Previously Assembled
Kit P/N 554873
Assembled
Views
* Use "Spacer Busbars" or "Spacer Insulators" on end bays or stand-alone bays. For multiple bays, use "Spacer Busbars" and move out to 'bridge' between busbars of both Assemblies.
Previously Assembled
Kit P/N 554873

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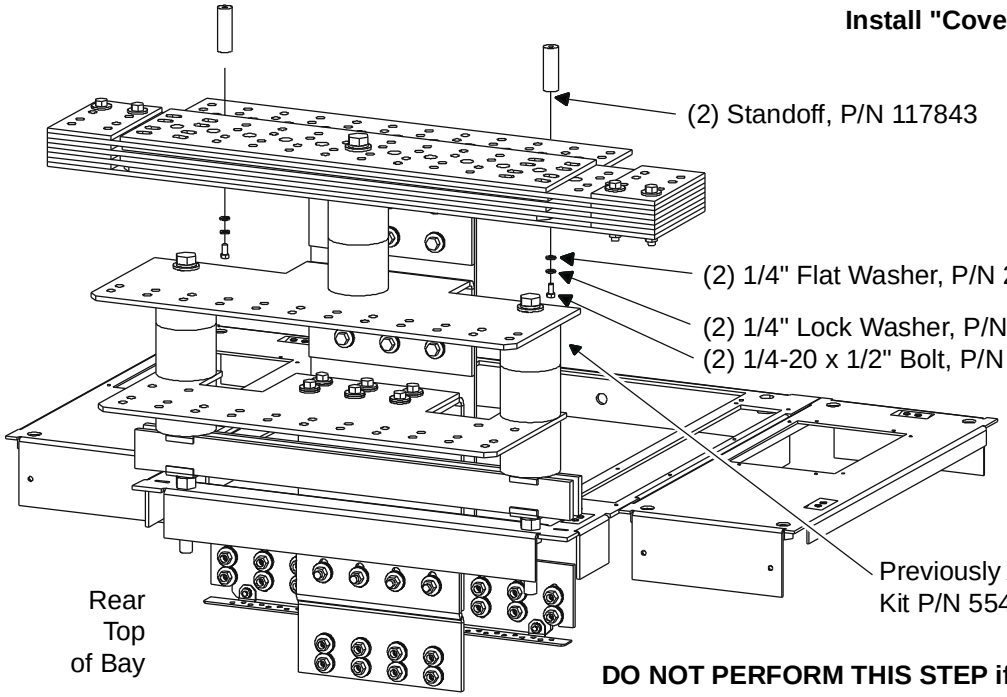
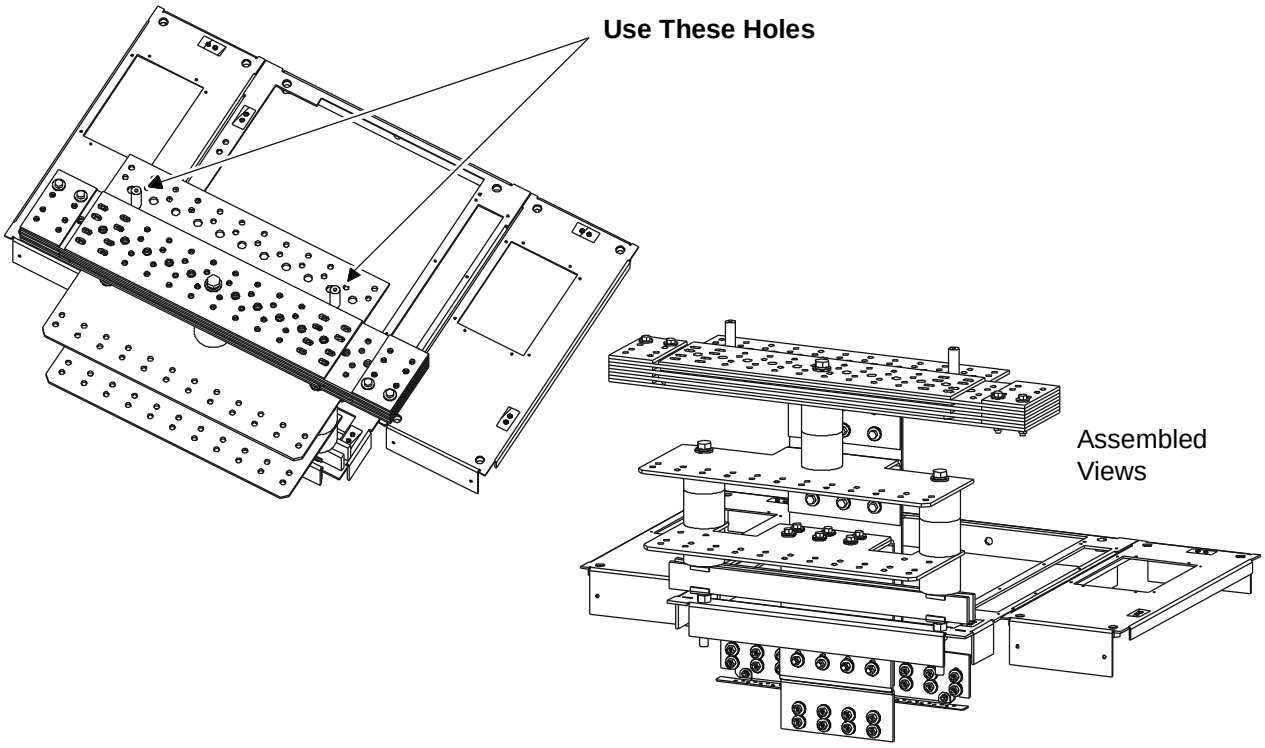
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514690 or 514691)
Assembly Procedure Step 3

STEP 3

Install "Cover" Mounting Standoffs.



DO NOT PERFORM THIS STEP if you are going to install "Load Return Lug Extension Busbar Assembly" P/N 514543



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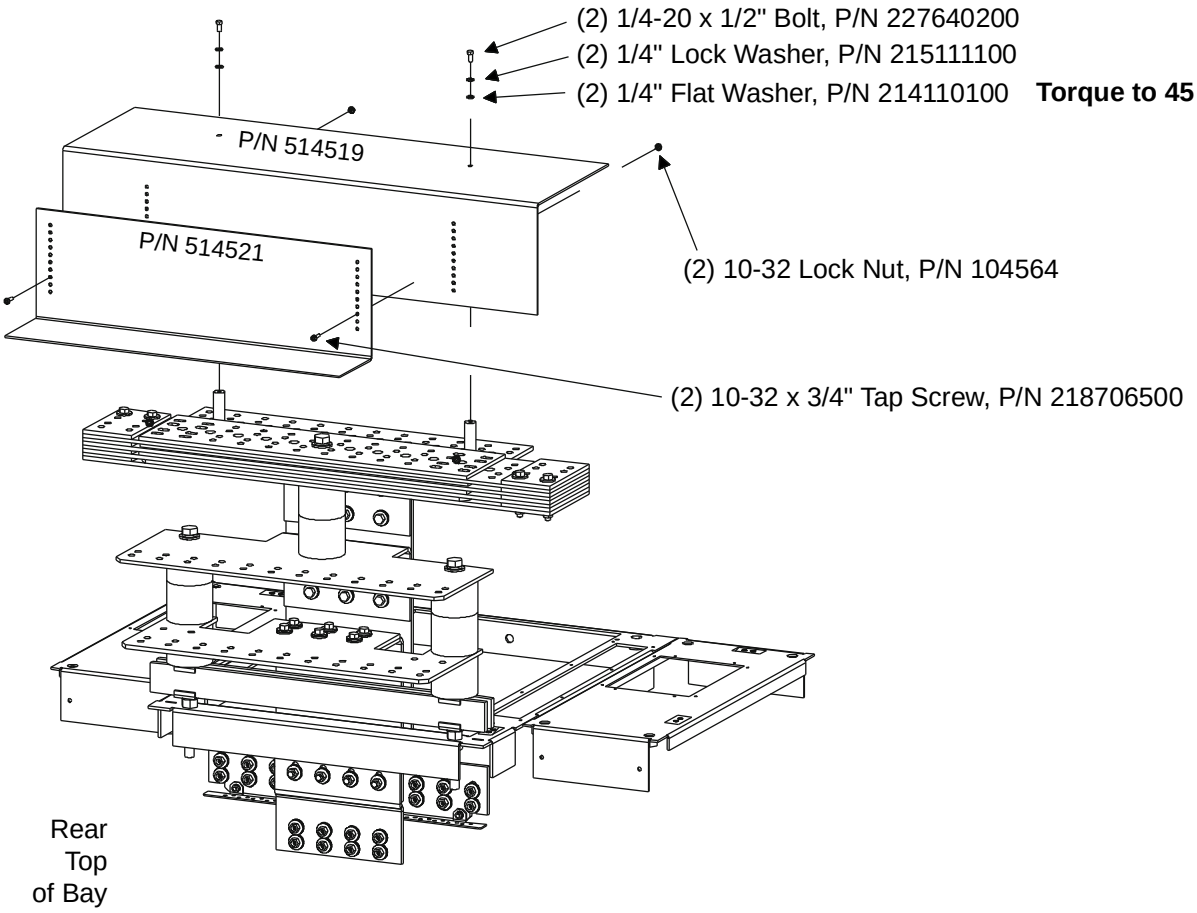
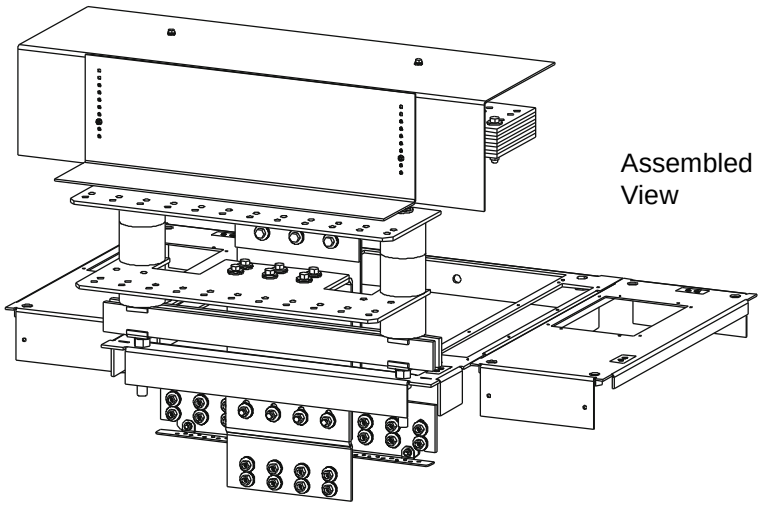
Power/Distribution Bay
External Top-Mount Ground (Load Return) Busbar Assembly (P/N 514690 or 514691)
Assembly Procedure Step 4

DO NOT PERFORM THIS STEP if you are going to install "Load Return Lug Extension Busbar Assembly" P/N 514543

STEP 4

Install "Covers".





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Power/Distribution Bay
Load Return Lug Extension Busbar Assembly (P/N 514543)
Assembly Procedure Step 1A

STEP 1A

Install "Load Return Lug Extension Busbar" (List 1 and 11 Bays).

Remove any previously installed bolts from these four locations

Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.

(1*) Busbar, P/N 514542

(8*) 3/8-16 x 3" Bolt, P/N 227647800
Torque to 180 in-lbs.

(8*) 3/8" Flat Washer, P/N 214204100 (hardened, thicker than other Kit supplied 3/8" flat washer)

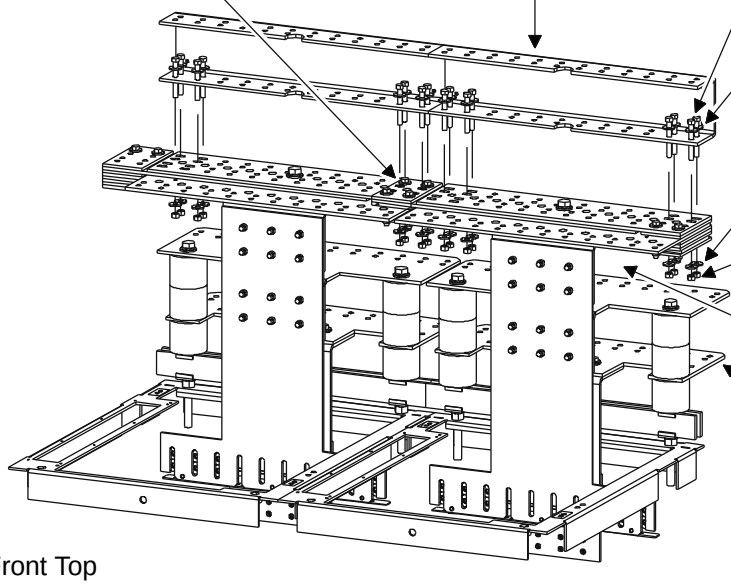
(8*) 3/8" Belleville Washer, P/N 214825000

(8*) 3/8-16 Nut, P/N 228567100

* Quantities are per Kit, two Kits shown in Illustrations.

Previously Assembled Kit P/N 514688 or 514689

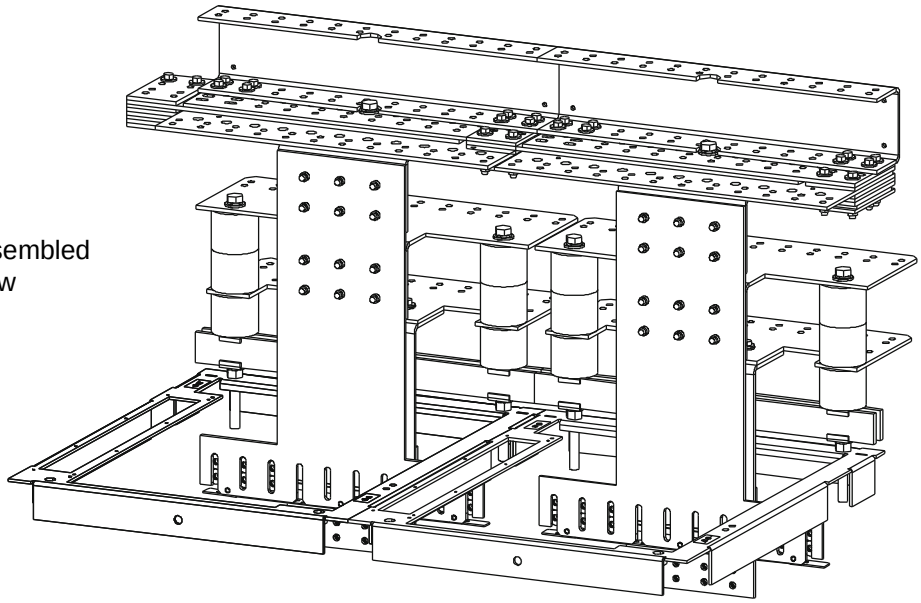
Previously Assembled Kit P/N 554873



Front Top of Bay

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt Head.

Assembled View



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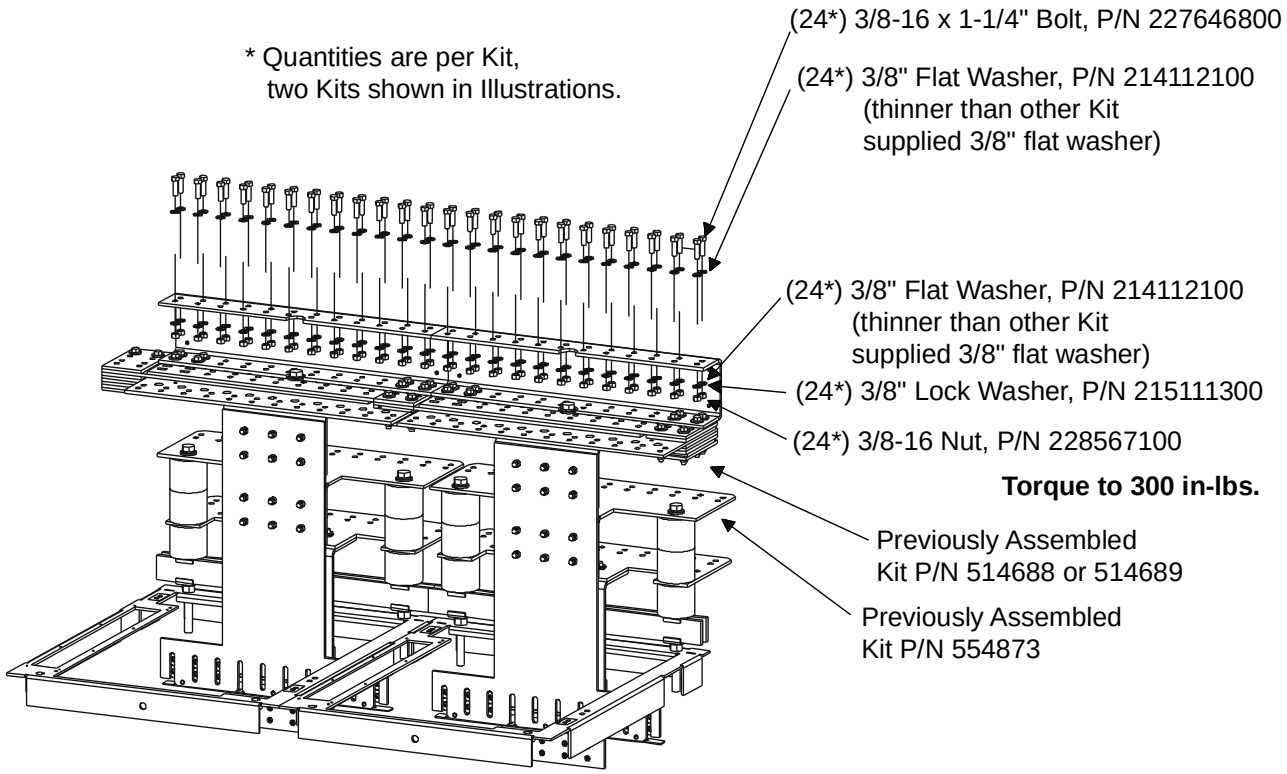
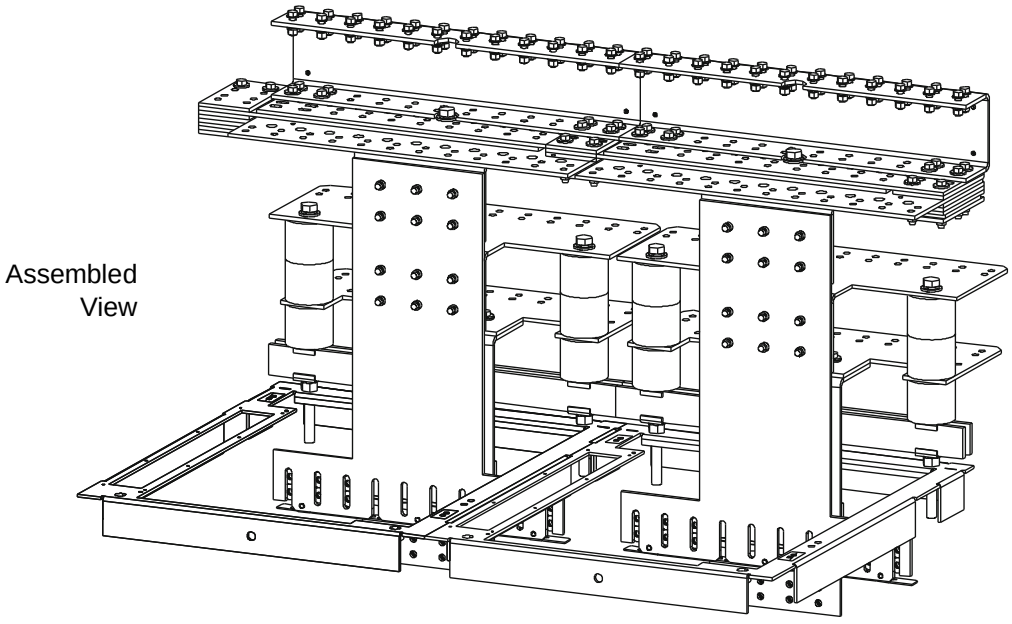
Power/Distribution Bay
Load Return Lug Extension Busbar Assembly (P/N 514543)
Assembly Procedure Step 2A

PROCEDURE PROVIDED FOR REFERENCE ONLY, INSTALL BOLTS AS LUGS ARE INSTALLED TO BUSBAR

STEP 2A
Install "Lug Mounting Bolts" (List 1 and 11 Bays).


* Quantities are per Kit, two Kits shown in Illustrations.
(24*) 3/8-16 x 1-1/4" Bolt, P/N 227646800
(24*) 3/8" Flat Washer, P/N 214112100 (thinner than other Kit supplied 3/8" flat washer)
(24*) 3/8" Flat Washer, P/N 214112100 (thinner than other Kit supplied 3/8" flat washer)
(24*) 3/8" Lock Washer, P/N 215111300
(24*) 3/8-16 Nut, P/N 228567100
Torque to 300 in-lbs.
Previously Assembled Kit P/N 514688 or 514689
Previously Assembled Kit P/N 554873
Front Top of Bay



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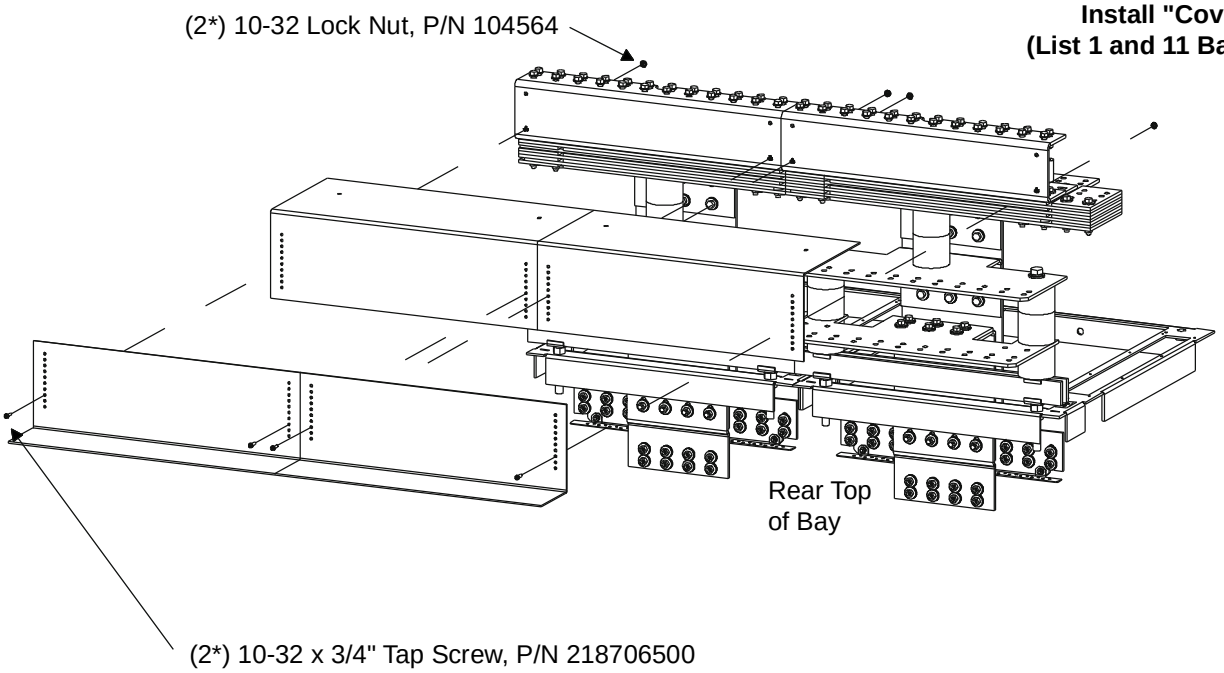
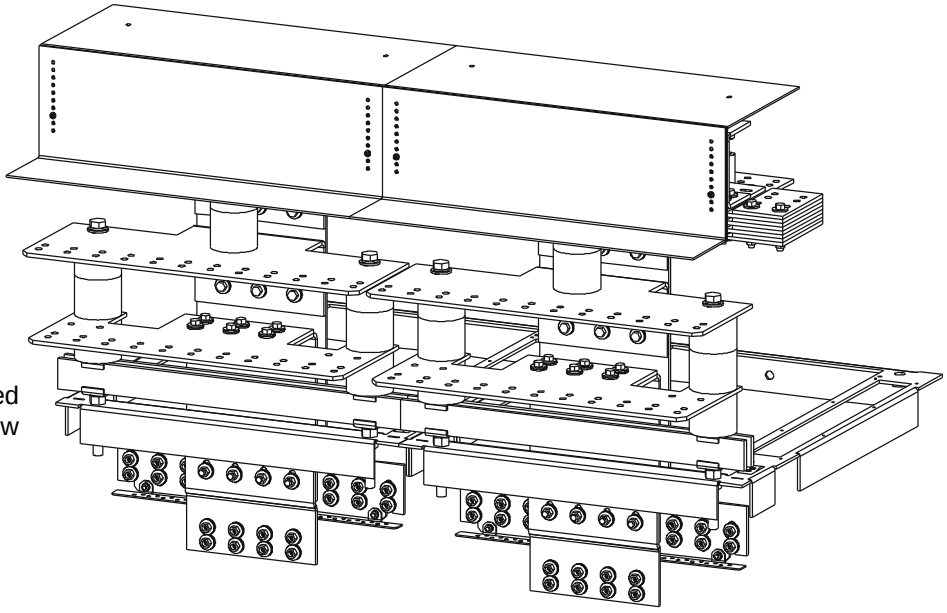
Power/Distribution Bay
Load Return Lug Extension Busbar Assembly (P/N 514543)
Assembly Procedure Step 3A

STEP 3A
Install "Covers"
(List 1 and 11 Bays).



* Parts are from the P/N 514688 or 514689 Kit.
Quantities are per Kit, two Kits shown in Illustrations.
The following parts are not used: (2) 1/4-20 x 1/2" Bolt (P/N 227640200), (2) 1/4" Lock Washer (P/N 215111100), (2) 1/4" Flat Washer (P/N 214110100)



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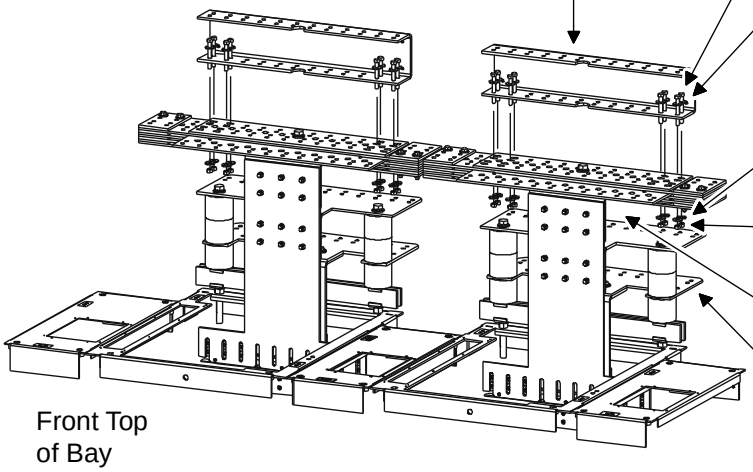
Power/Distribution Bay
Load Return Lug Extension Busbar Assembly (P/N 514543)
Assembly Procedure Step 1B

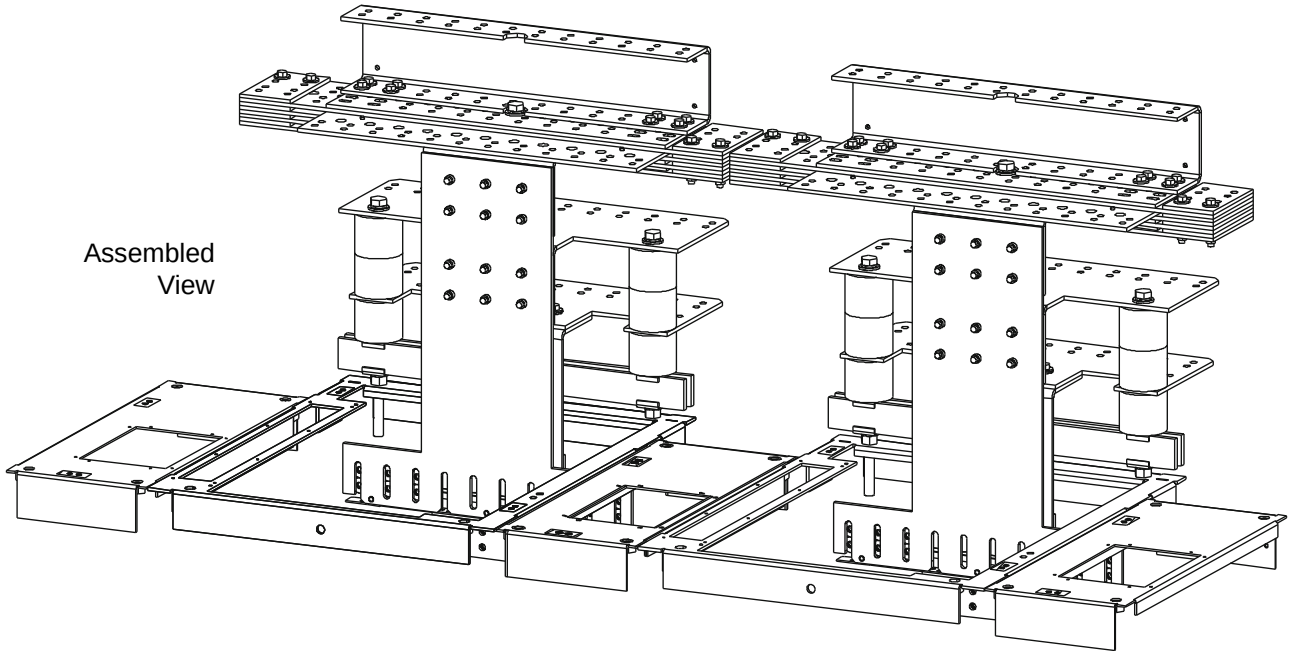
STEP 1B

Install "Load Return Lug Extension Busbar"
(List 2 and 12 Bays E/W List 30 or 31 PDSC).

Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.


(8*) 3/8-16 x 3" Bolt, P/N 227647800
Torque to 180 in-lbs.
(1*) Busbar, P/N 514542
(8*) 3/8" Flat Washer, P/N 214204100 (hardened, thicker than other Kit supplied 3/8" flat washer)
(8*) 3/8" Belleville Washer, P/N 214825000
(8*) 3/8-16 Nut, P/N 228567100
* Quantities are per Kit, two Kits shown in Illustrations.
Previously Assembled Kit P/N 514690 or 514691
Previously Assembled Kit P/N 554873
Front Top of Bay

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt Head.



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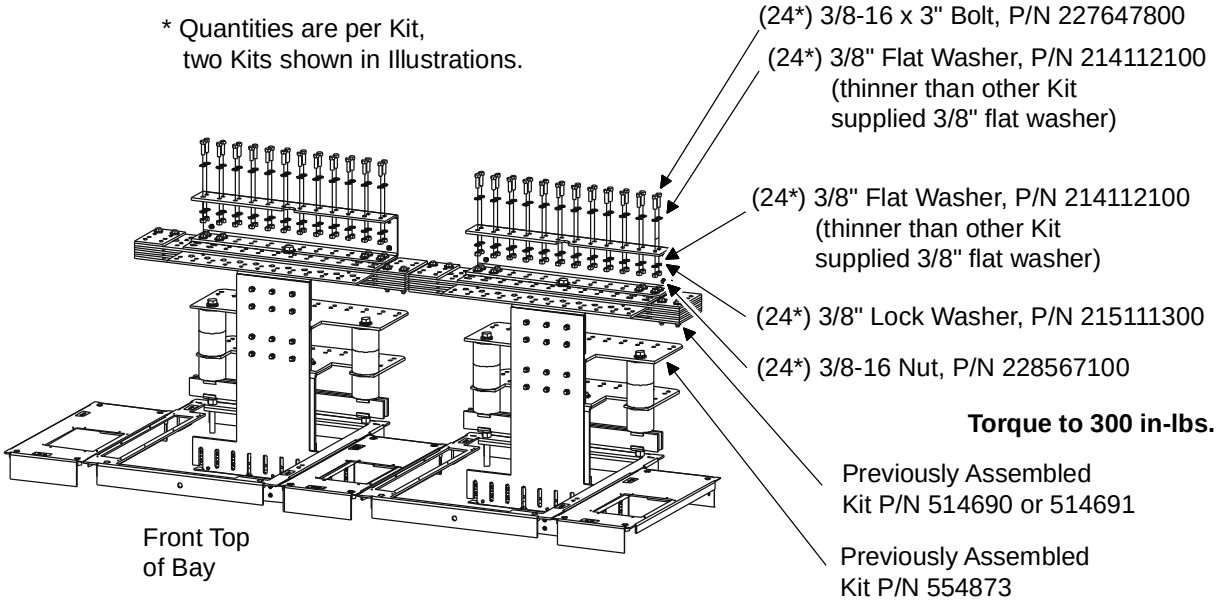
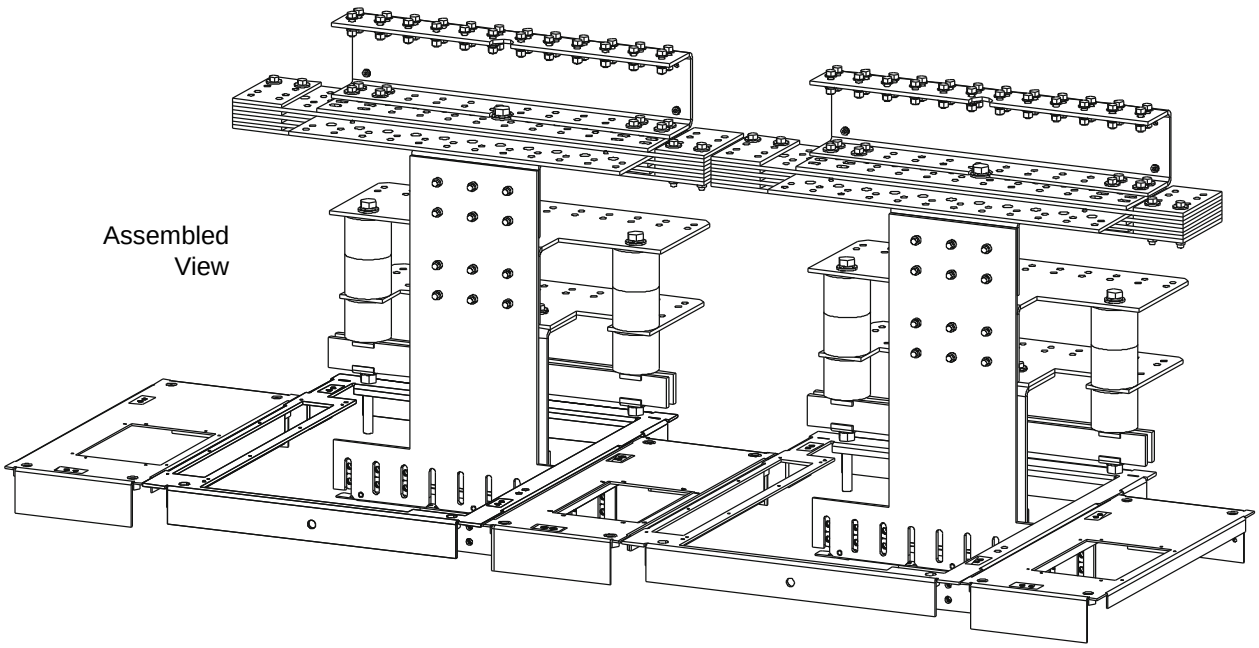
Power/Distribution Bay
Load Return Lug Extension Busbar Assembly (P/N 514543)
Assembly Procedure Step 2B

STEP 2B

Install "Lug Mounting Bolts"
(List 2 and 12 Bays E/W List 30 or 31 PDSC).

PROCEDURE PROVIDED FOR REFERENCE ONLY,
INSTALL BOLTS AS LUGS ARE INSTALLED TO BUSBAR


* Quantities are per Kit,
two Kits shown in Illustrations.
(24*) 3/8-16 x 3" Bolt, P/N 227647800
(24*) 3/8" Flat Washer, P/N 214112100
(thinner than other Kit
supplied 3/8" flat washer)
(24*) 3/8" Flat Washer, P/N 214112100
(thinner than other Kit
supplied 3/8" flat washer)
(24*) 3/8" Lock Washer, P/N 215111300
(24*) 3/8-16 Nut, P/N 228567100
Torque to 300 in-lbs.
Previously Assembled
Kit P/N 514690 or 514691
Previously Assembled
Kit P/N 554873
Front Top
of Bay



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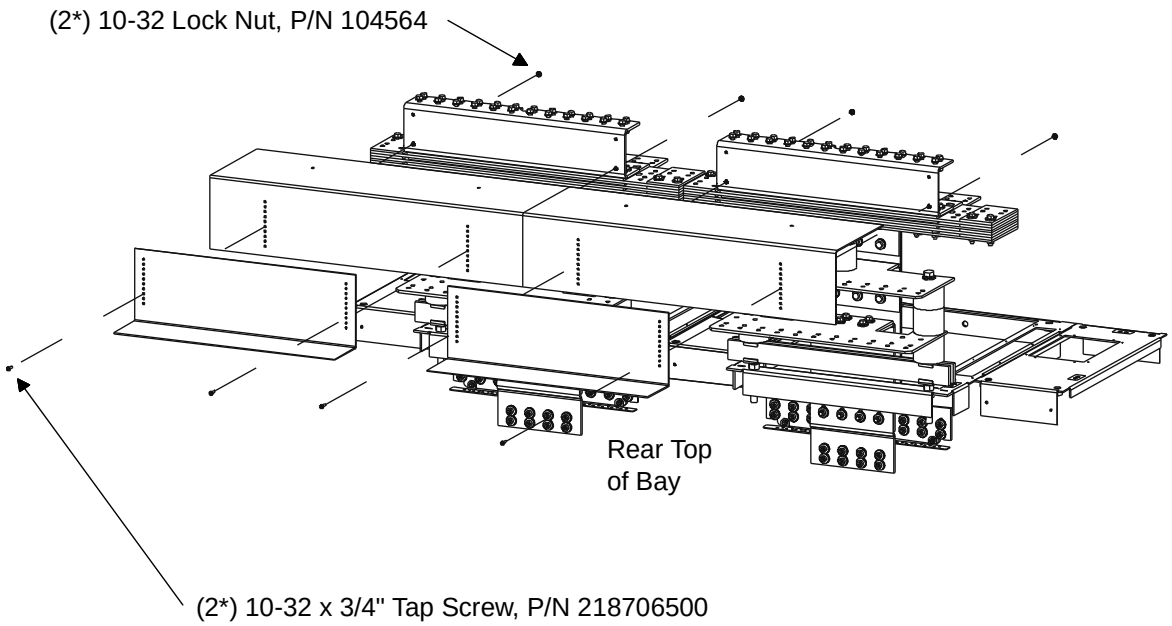
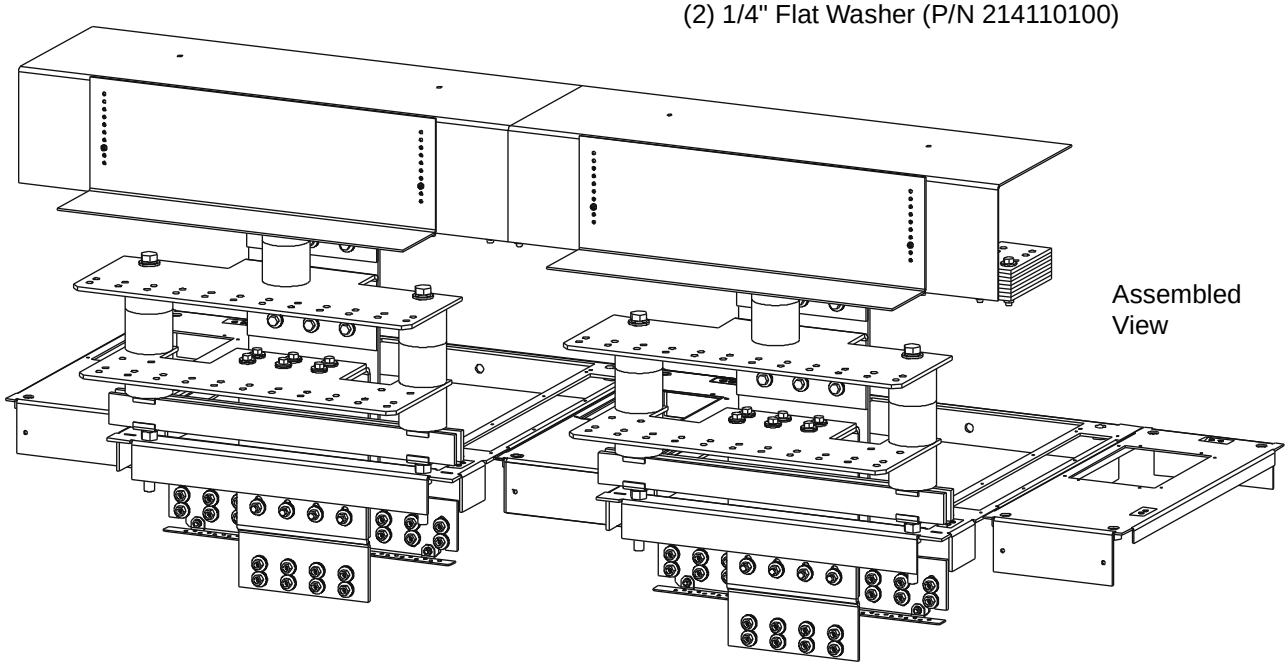
Power/Distribution Bay
Load Return Lug Extension Busbar Assembly (P/N 514543)
Assembly Procedure Step 3B

STEP 3B

Install "Covers"
(List 2 and 12 Bays E/W List 30 or 31 PDSC).



* Parts are from the P/N 514690 or 514691 Kit. Quantities are per Kit, two Kits shown in Illustrations. The following parts are not used: (2) 1/4-20 x 1/2" Bolt (P/N 227640200), (2) 1/4" Lock Washer (P/N 215111100), (2) 1/4" Flat Washer (P/N 214110100)



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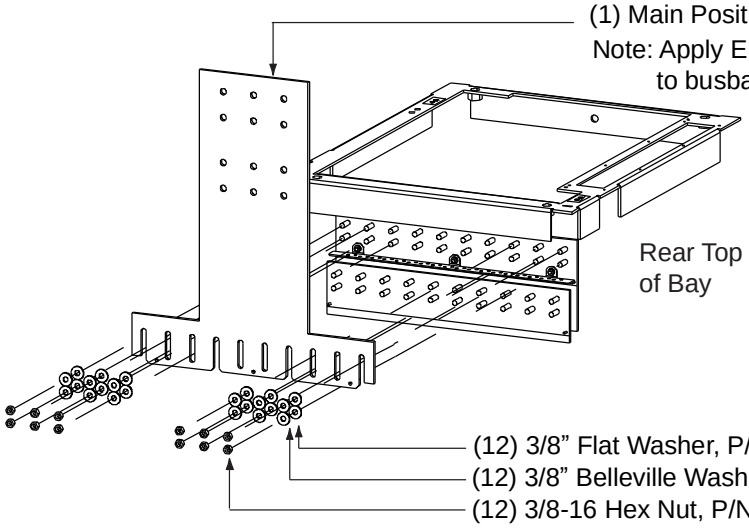
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 1

STEP 1

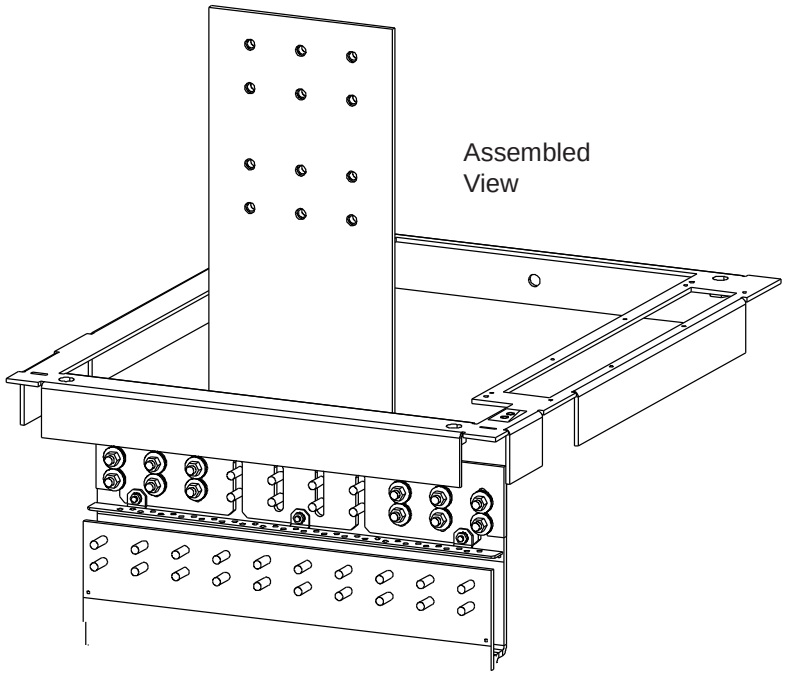
Install "Main Positive Busbar" onto Bay Positive Busbar.


(1) Main Positive Busbar, P/N 554877
Note: Apply Electrical Anti-Oxidation Compound to busbar mating surfaces.
Rear Top of Bay
(12) 3/8" Flat Washer, P/N 214204100
(12) 3/8" Belleville Washer, P/N 214825000
(12) 3/8-16 Hex Nut, P/N 228567100 **Hand-tighten only.**

Do the following first before assembly:

1. Remove 552402 (1) and 116638 (4) from Bay.
2. Mount 554880 to the 554877 with 116638 (3).

Note: Concave side of Bellville washer faces busbar; convex side faces hex nut.



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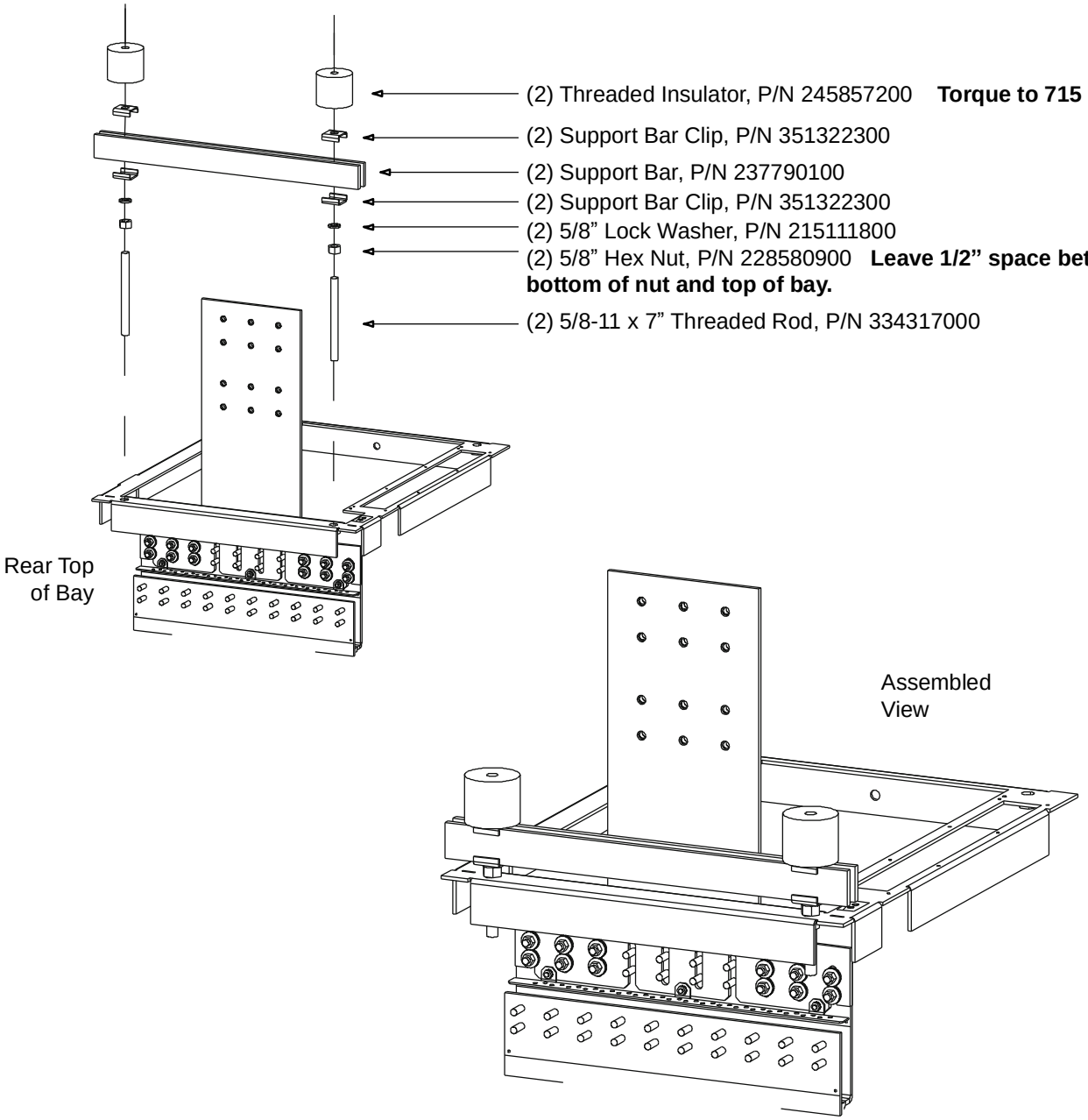
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 2

STEP 2

Install "Support Bar" and "Related Hardware" onto Top of Bay.


(2) Threaded Insulator, P/N 245857200 **Torque to 715 in-lbs.**
(2) Support Bar Clip, P/N 351322300
(2) Support Bar, P/N 237790100
(2) Support Bar Clip, P/N 351322300
(2) 5/8" Lock Washer, P/N 215111800
(2) 5/8" Hex Nut, P/N 228580900 **Leave 1/2" space between bottom of nut and top of bay.**
(2) 5/8-11 x 7" Threaded Rod, P/N 334317000
Rear Top of Bay
Assembled View

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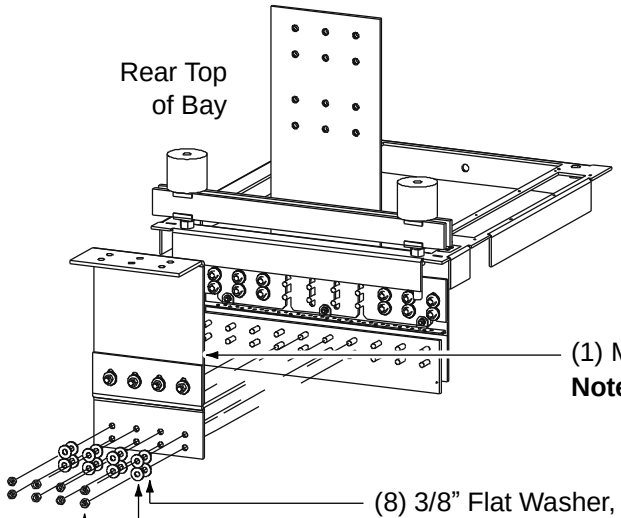
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 3

STEP 3

Install "Main Negative Busbar" onto Bay Negative Busbar.



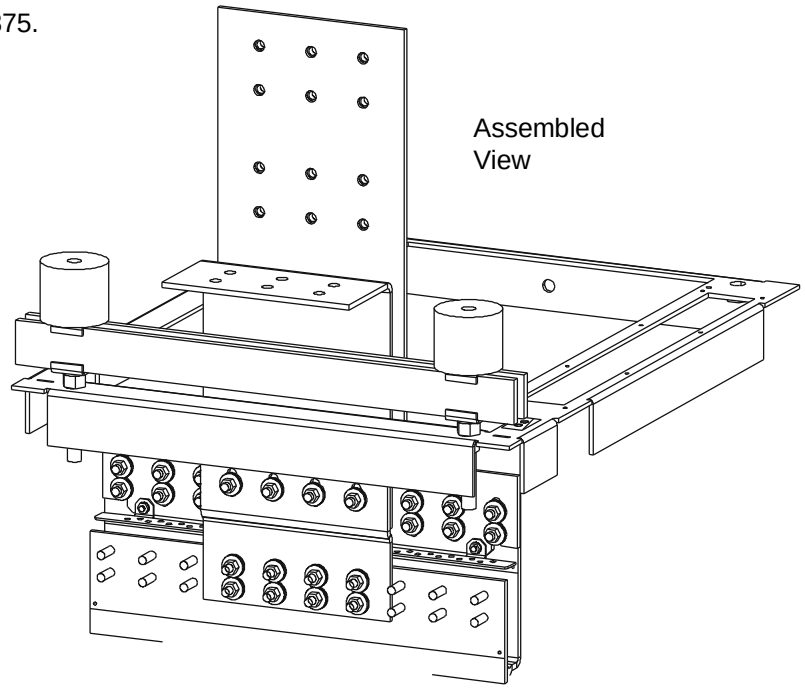
(1) Main Negative Busbar, P/N 554875
Note: Apply Electrical Anti-Oxidation Compound to busbar mating services.

(8) 3/8" Flat Washer, P/N 214204100
(8) 3/8" Belleville Washer, P/N 214825000

(8) 3/8-16 Hex Nut, P/N 228567100 **Hand-tighten only.**

Note: Concave side of Belleville washer faces busbar; convex side faces hex nut.

Mount 554876 to the 554875.
Hardware:
214204100 (4)
214825000 (4)
228567100 (4)



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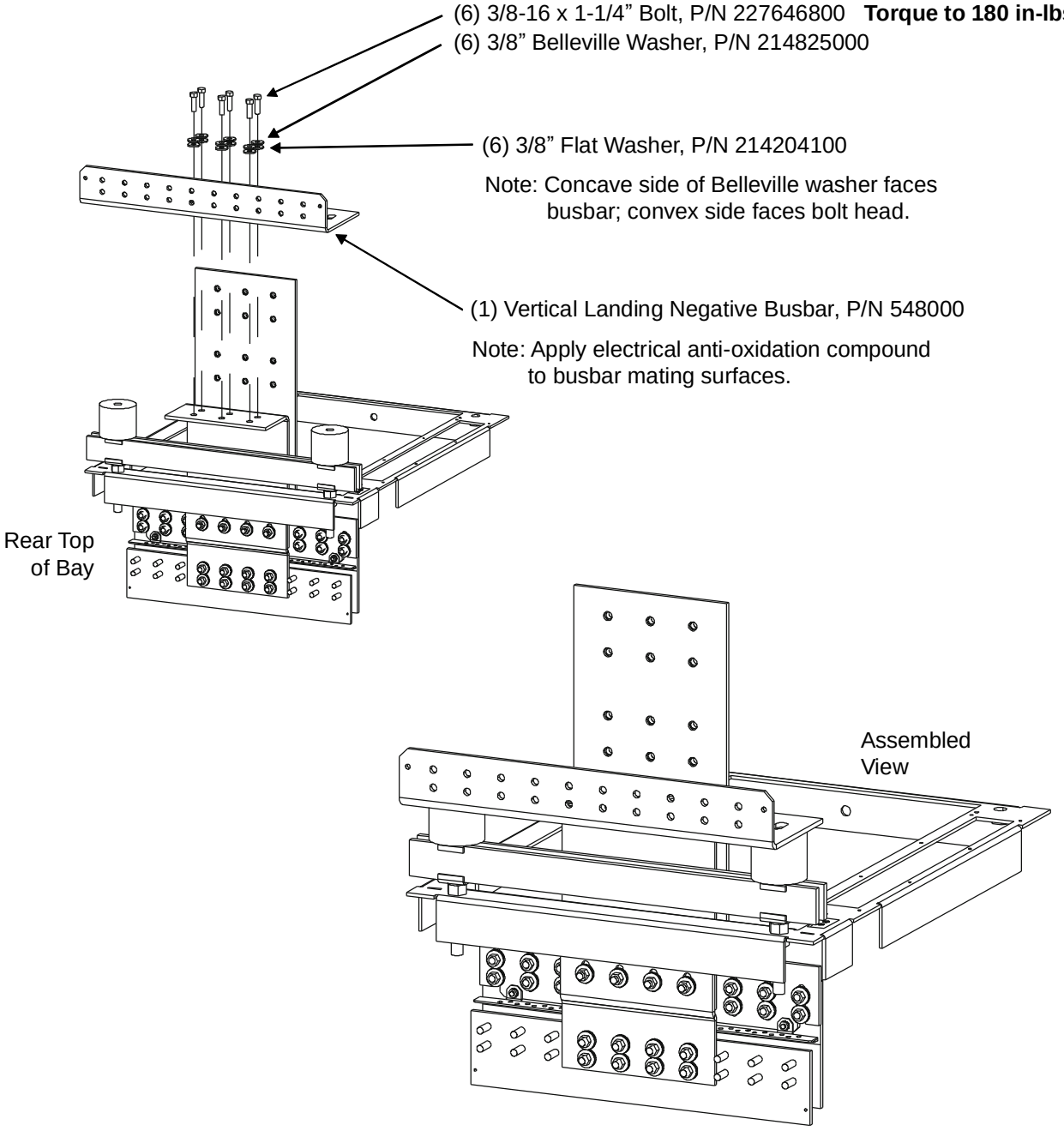
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 4

STEP 4

Install "Vertical Landing Negative Busbar" onto "Main Negative Busbar".


(6) 3/8-16 x 1-1/4" Bolt, P/N 227646800 **Torque to 180 in-lbs.**
(6) 3/8" Belleville Washer, P/N 214825000
(6) 3/8" Flat Washer, P/N 214204100
Note: Concave side of Belleville washer faces busbar; convex side faces bolt head.
(1) Vertical Landing Negative Busbar, P/N 548000
Note: Apply electrical anti-oxidation compound to busbar mating surfaces.
Rear Top of Bay
Assembled View

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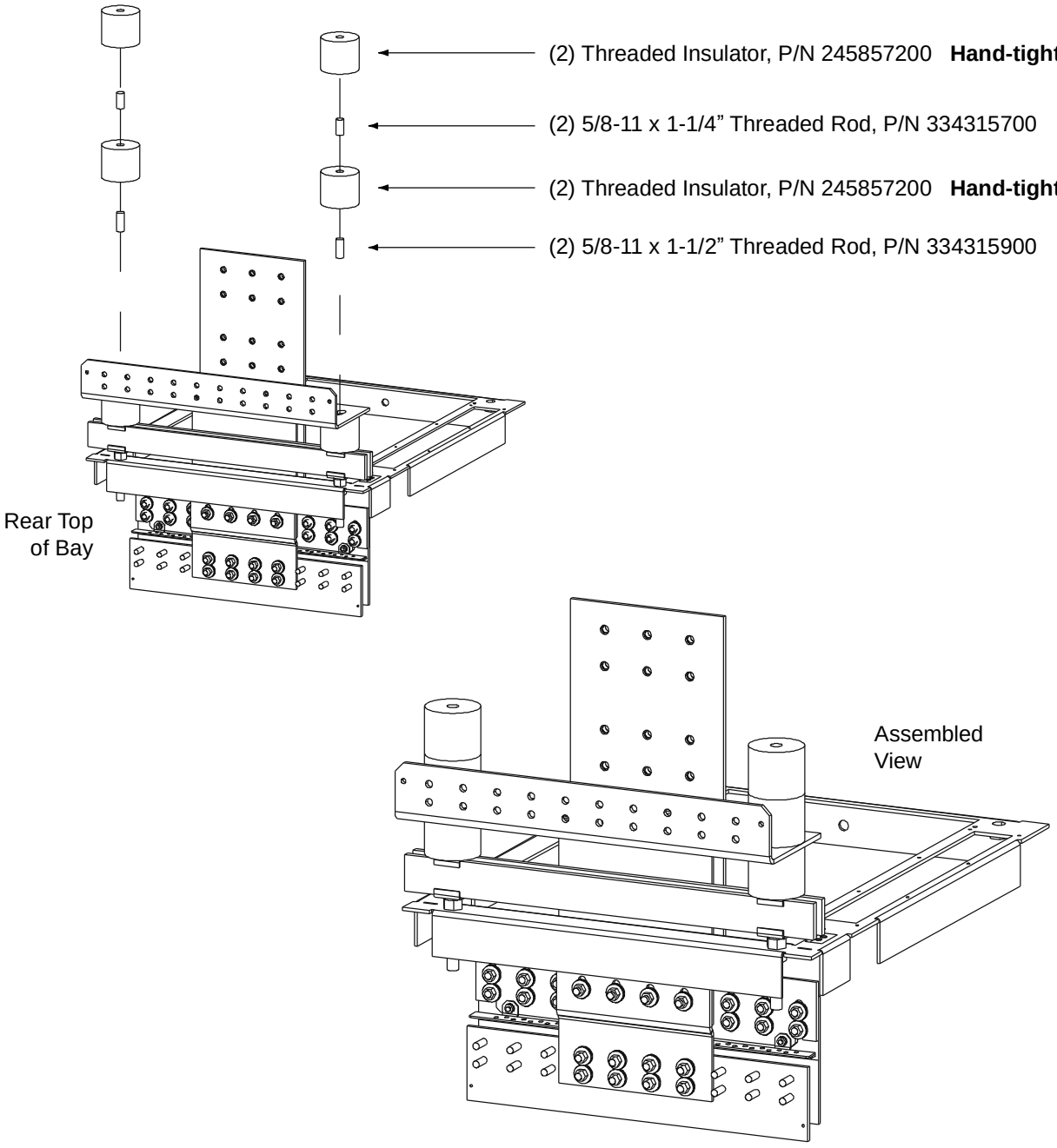
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 5

STEP 5

Install "Threaded Insulators" onto "Vertical Landing Negative Busbar".


(2) Threaded Insulator, P/N 245857200 **Hand-tighten only.**
(2) 5/8-11 x 1-1/4" Threaded Rod, P/N 334315700
(2) Threaded Insulator, P/N 245857200 **Hand-tighten only.**
(2) 5/8-11 x 1-1/2" Threaded Rod, P/N 334315900
Rear Top of Bay
Assembled View

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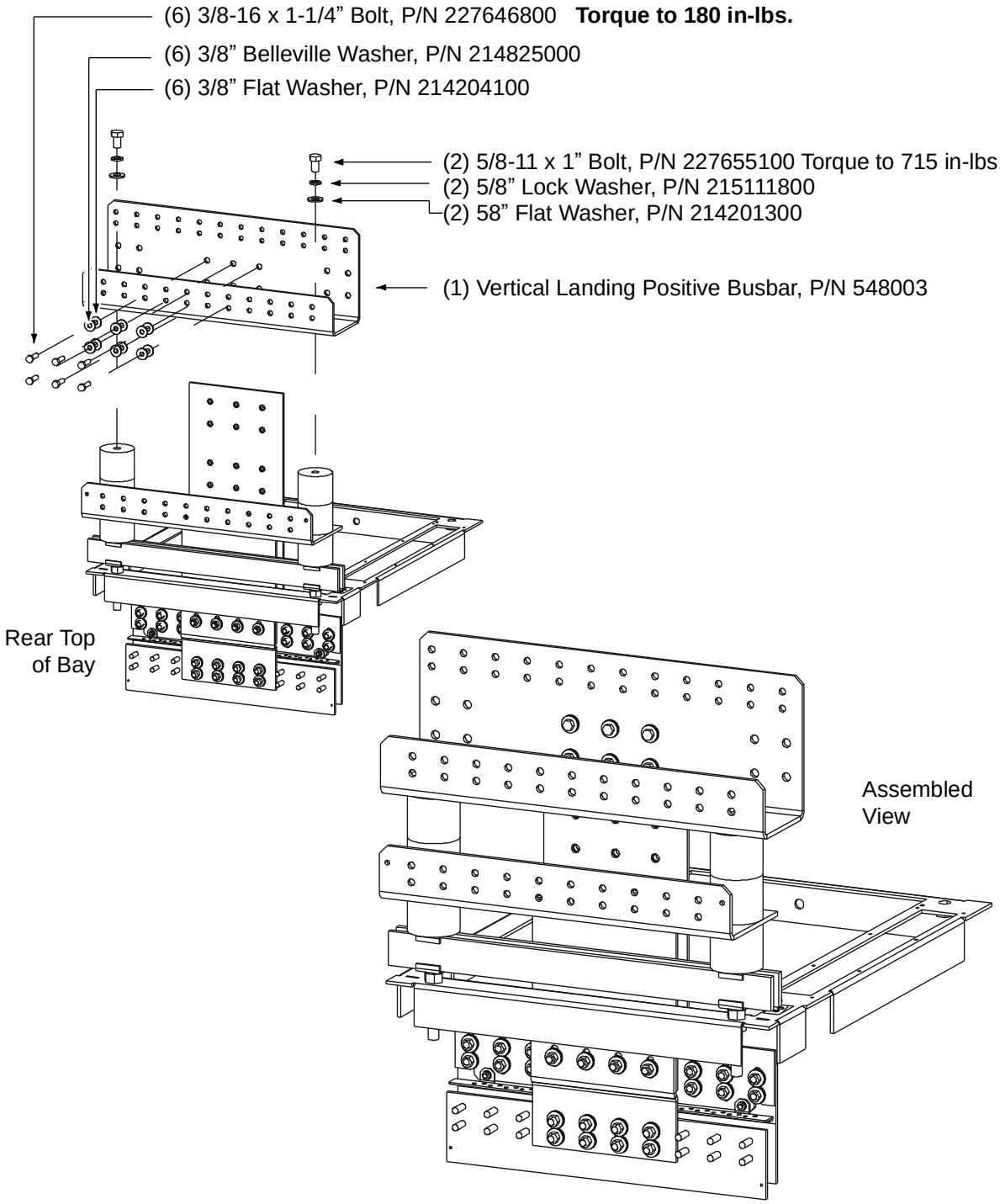
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 6

STEP 6

Install "Vertical Landing Positive Busbar" onto "Main Positive Busbar".


(6) 3/8-16 x 1-1/4" Bolt, P/N 227646800 **Torque to 180 in-lbs.**
(6) 3/8" Belleville Washer, P/N 214825000
(6) 3/8" Flat Washer, P/N 214204100
(2) 5/8-11 x 1" Bolt, P/N 227655100 Torque to 715 in-lbs.
(2) 5/8" Lock Washer, P/N 215111800
(2) 58" Flat Washer, P/N 214201300
(1) Vertical Landing Positive Busbar, P/N 548003
Rear Top of Bay
Assembled View

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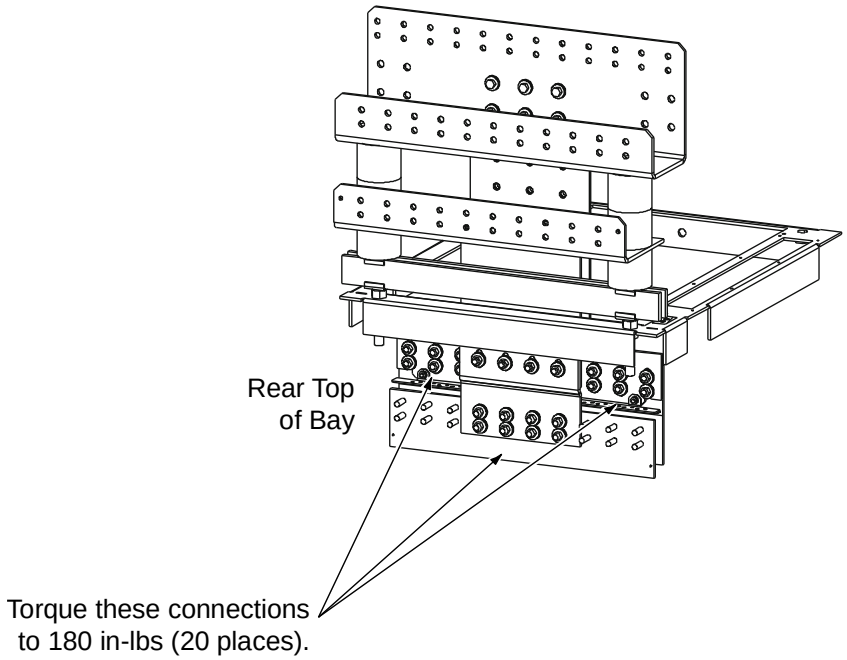
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 7

STEP 7
Final Torque



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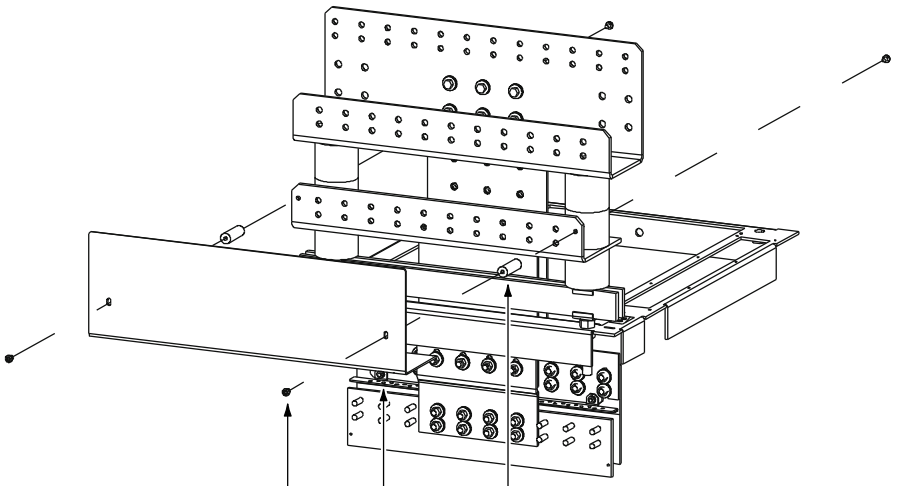
Power/Distribution Bay
External Top-Mount Vertical Battery Input Busbar Assembly (P/N 554874)
Assembly Procedure Step 8

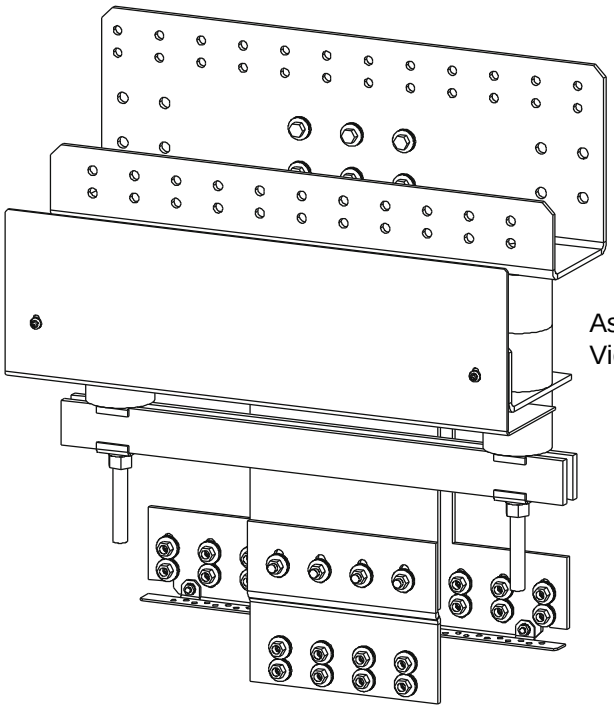
STEP 8
Install Shield



(2) Standoff Insulator, P/N 117843

(1) Plastic Shield, P/N 548002

(4) 14-20 x 3/8” Pan Head Tap Screw, P/N 218708200



Assembled View

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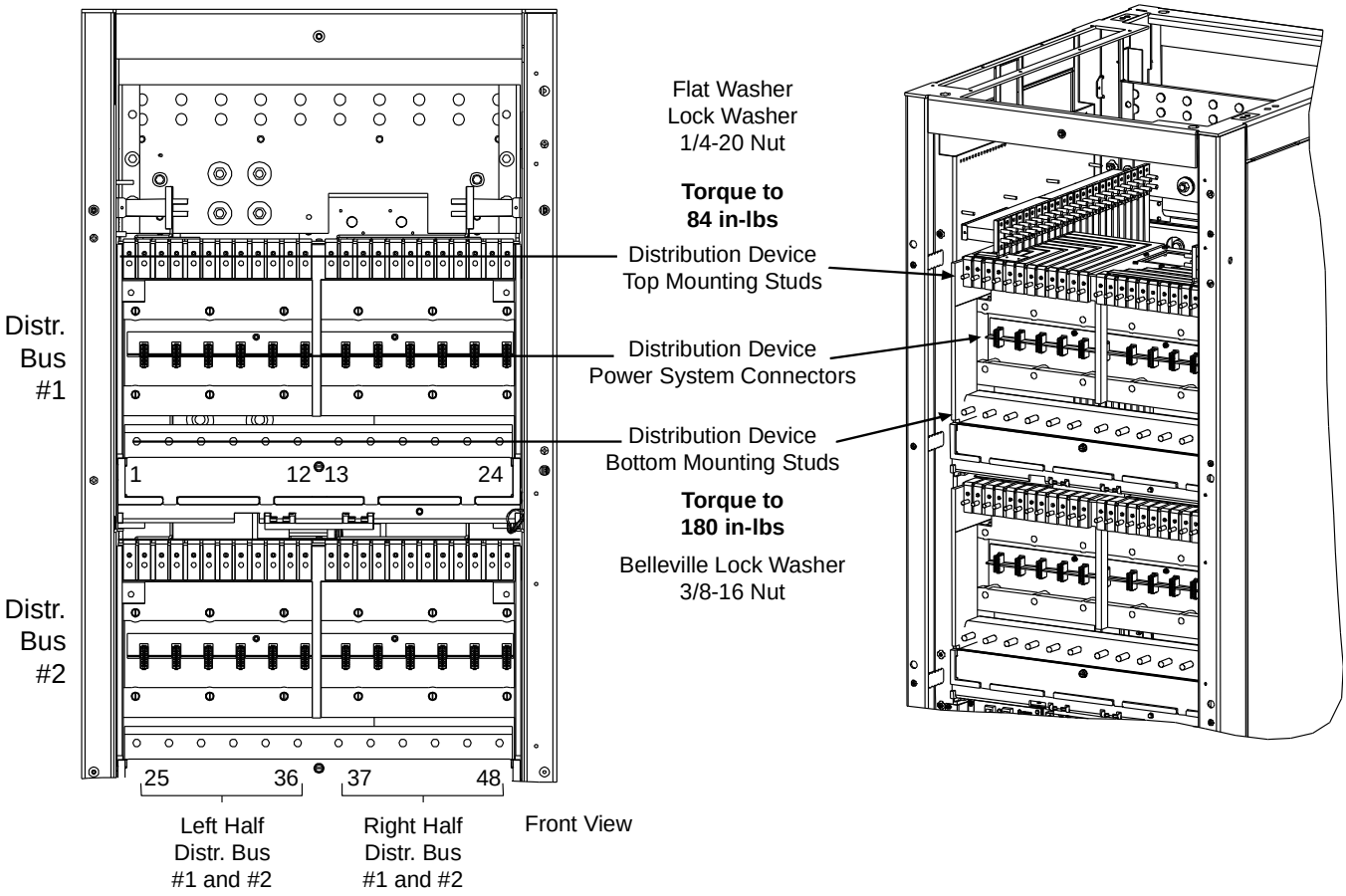
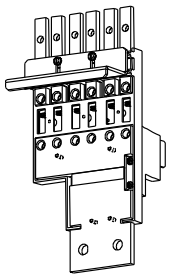
Installing 218 Circuit Breakers, TPL Fuseholders, and Bullet Nose-Type Device Mounting Assemblies into Power/Distribution Bays



Note: Each half of each bus MUST be populated with distribution devices from left-to-right, without skipping any distribution device mounting positions within each half.

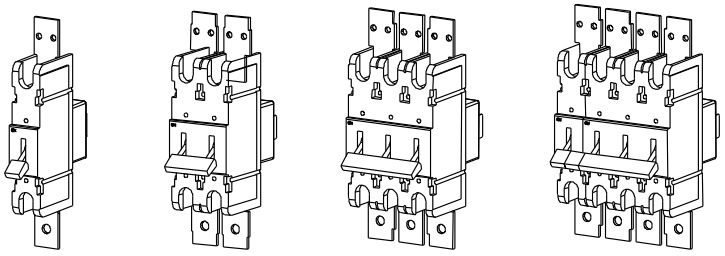
Bullet Nose-Type Device Mounting Assembly

3-Pole



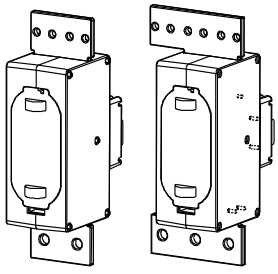
218 Circuit Breakers

1-Pole 2-Pole 3-Pole 4-Pole



TPL Fuseholders

2-Pole 3-Pole



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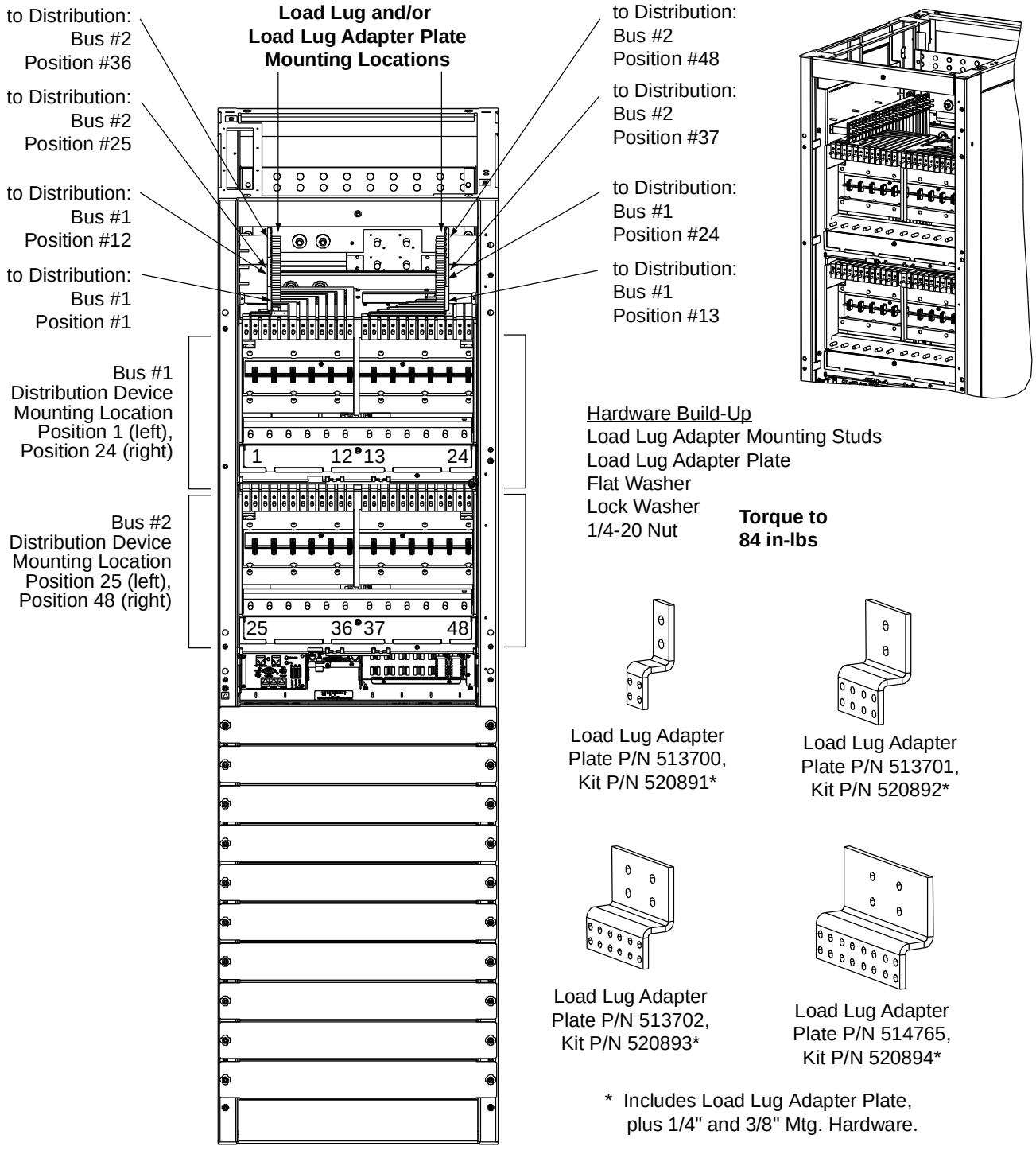
Installing Load Lug Adapter Plates into Power/Distribution Bays



Hardware Build-Up
Load Lug Adapter Mounting Studs
Load Lug Adapter Plate
Flat Washer
Lock Washer
1/4-20 Nut

Torque to 84 in-lbs

Load Lug Adapter Plate P/N 513700, Kit P/N 520891*

Load Lug Adapter Plate P/N 513701, Kit P/N 520892*

Load Lug Adapter Plate P/N 513702, Kit P/N 520893*

Load Lug Adapter Plate P/N 514765, Kit P/N 520894*

* Includes Load Lug Adapter Plate, plus 1/4" and 3/8" Mtg. Hardware.

Front View

REFER TO DISTRIBUTION DEVICES ILLUSTRATIONS FOR PROPER LOAD LUG ADAPTER SELECTION

NOTE THAT BULLET NOSE-TYPE DEVICE MOUNTING ASSEMBLIES DO NOT REQUIRE LOAD LUG ADAPTER PLATES

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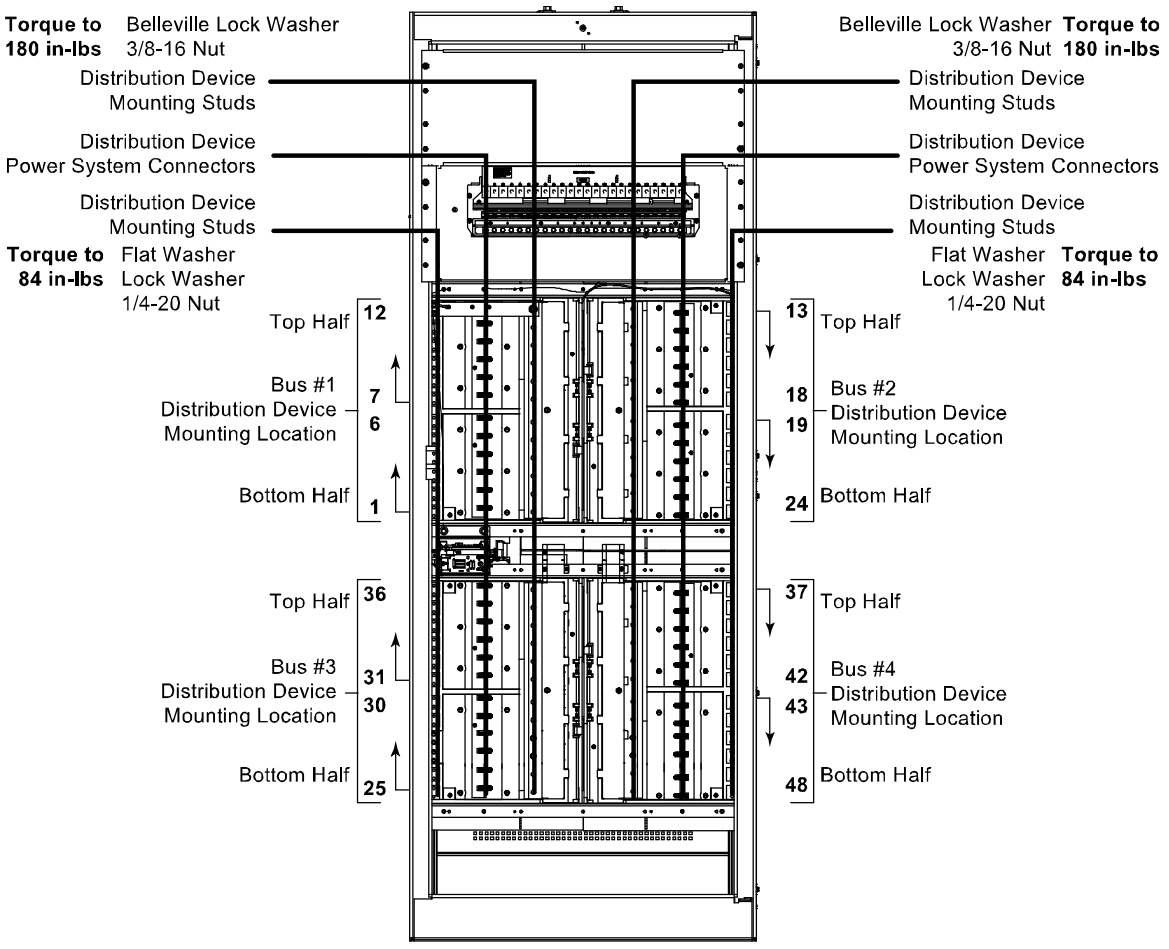
Installing 218 Circuit Breakers and TPL Fuseholders into Distribution Only Bays



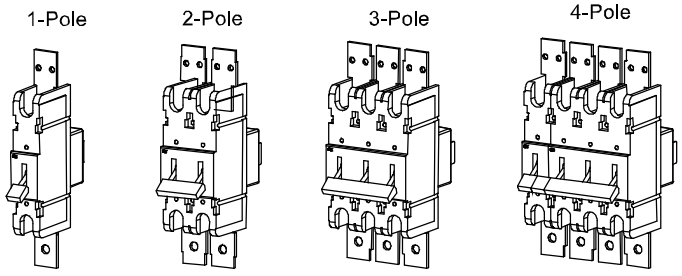
Front View
Door removed in illustration for clarity.

Note: On the left side, each half of each bus MUST be populated with distribution devices from bottom-to-top, without skipping any distribution device mounting positions within each half. (Arrows indicate starting position in each half.)

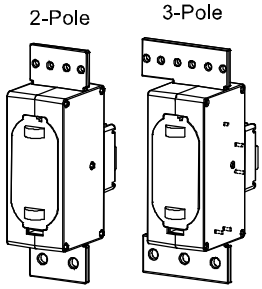
Note: On the right side, each half of each bus MUST be populated with distribution devices from top-to-bottom, without skipping any distribution device mounting positions within each half. (Arrows indicate starting position in each half.)

This allows automatic monitoring of each position and allow the controller to located all distribution positions.

218 Circuit Breakers



TPL Fuseholders



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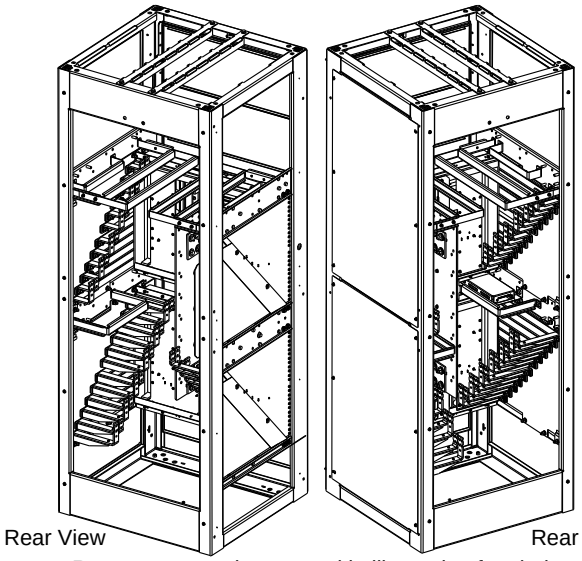
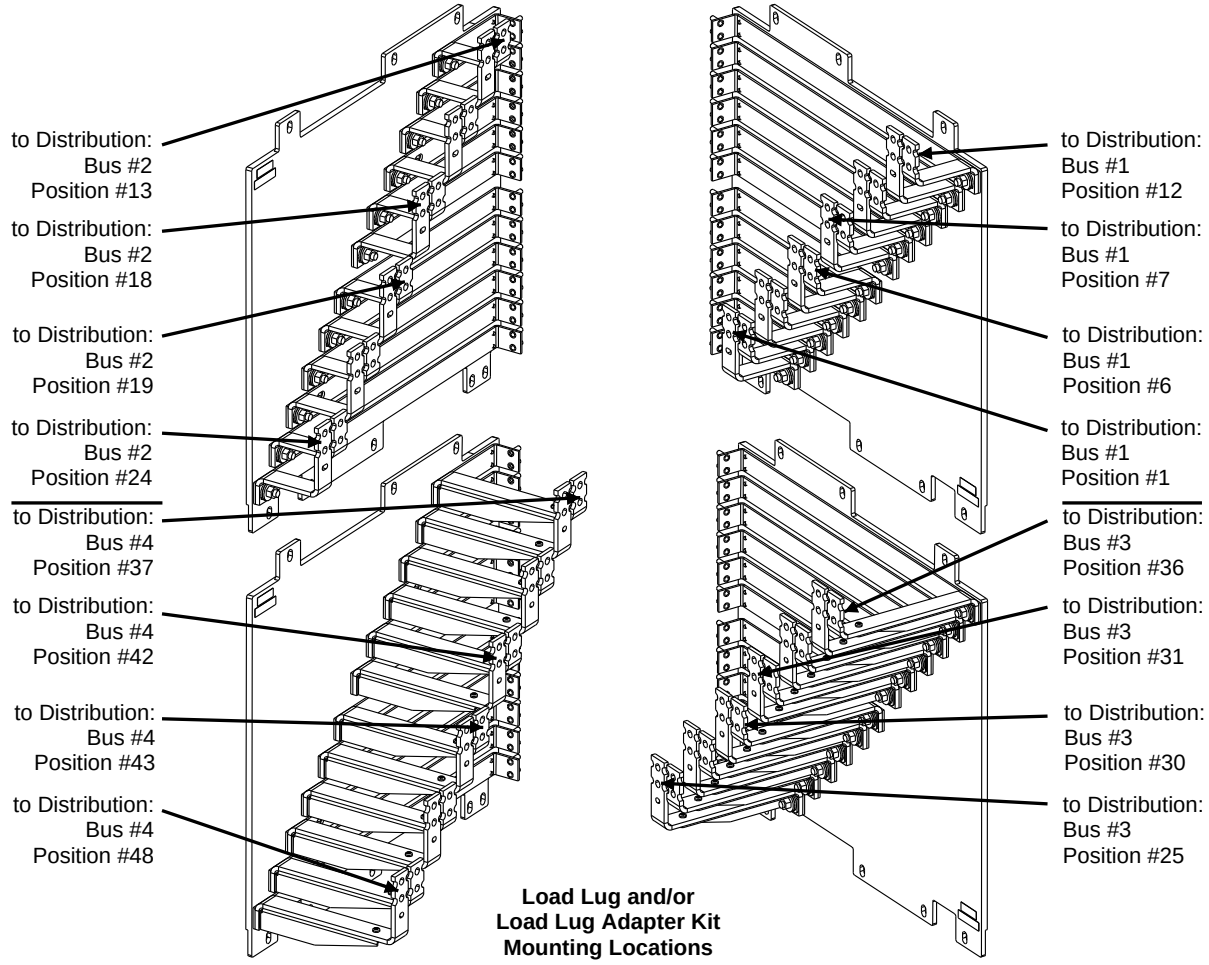
Installing Load Lug Adapter Plates into Distribution Only Bays



Rear View Rear View

Rear cover panels removed in illustration for clarity.


to Distribution: Bus #2 Position #13
to Distribution: Bus #2 Position #18
to Distribution: Bus #2 Position #19
to Distribution: Bus #2 Position #24
to Distribution: Bus #4 Position #37
to Distribution: Bus #4 Position #42
to Distribution: Bus #4 Position #43
to Distribution: Bus #4 Position #48
to Distribution: Bus #1 Position #12
to Distribution: Bus #1 Position #7
to Distribution: Bus #1 Position #6
to Distribution: Bus #1 Position #1
to Distribution: Bus #3 Position #36
to Distribution: Bus #3 Position #31
to Distribution: Bus #3 Position #30
to Distribution: Bus #3 Position #25

Load Lug and/or Load Lug Adapter Kit Mounting Locations

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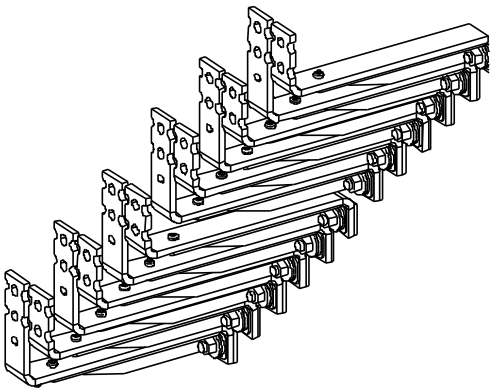
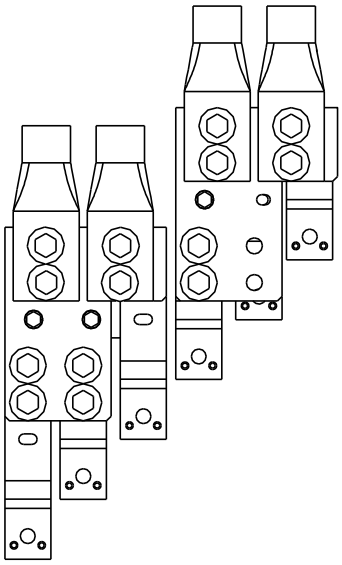
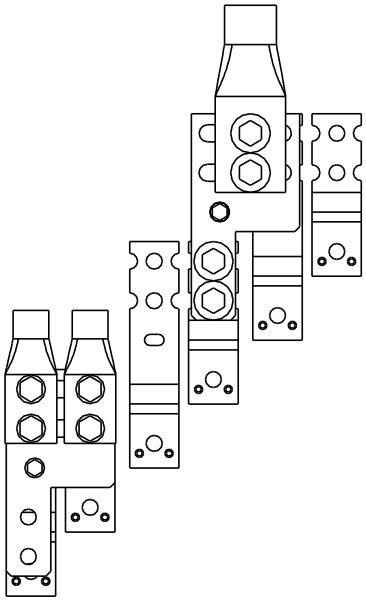
Installing Load Lug Adapter Plates into Distribution Only Bays (continuation)



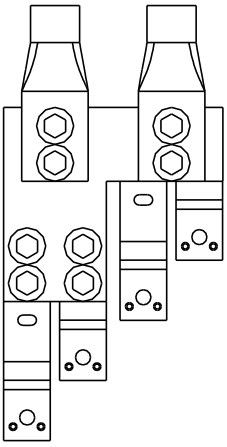
1-Position Devices
(Load Busbars with NO
Lug Adapters Installed)



3-Position
Lug Adapter Kit
P/N 529131



2-Position
Lug Adapter Kit
P/N 529132



4-Position
Lug Adapter Kit
P/N 534420

NOTE THAT 1-POLE 218 CIRCUIT BREAKERS DO NOT REQUIRE LOAD LUG ADAPTER PLATES

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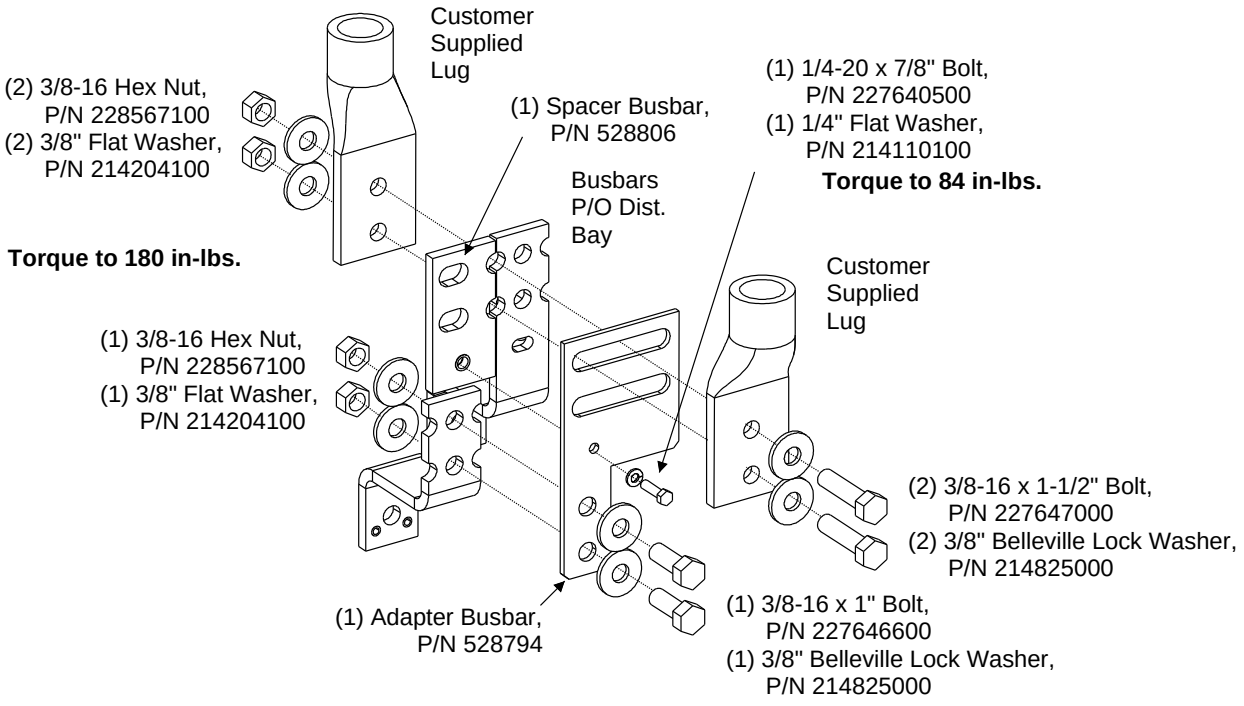
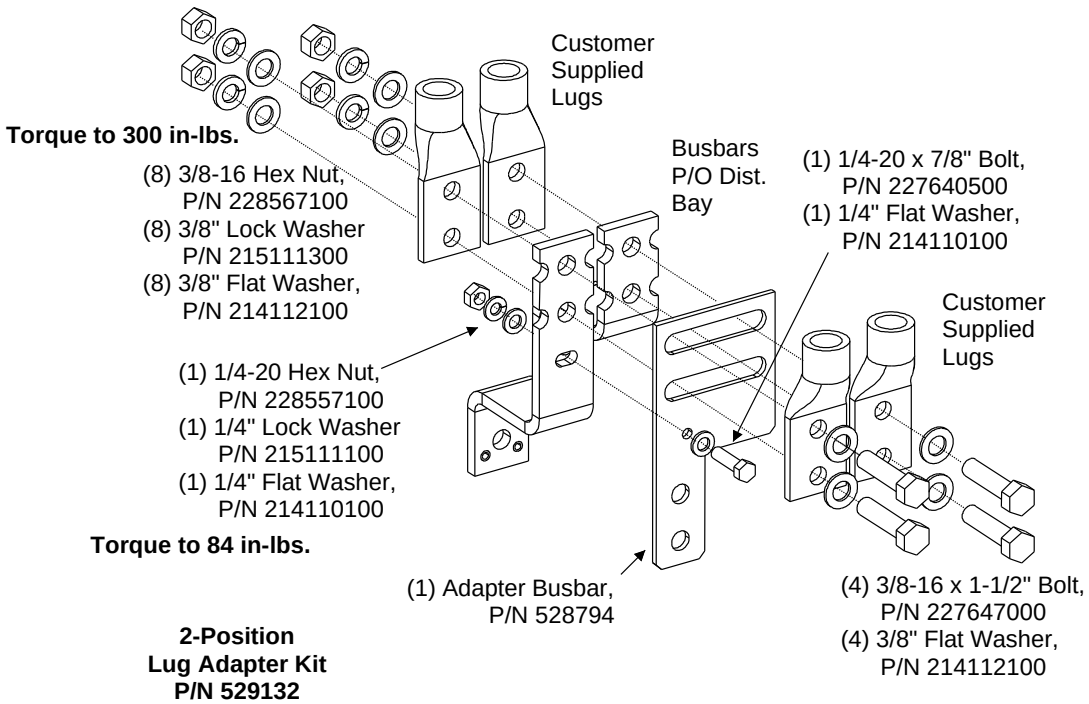
Installing Load Lug Adapter Plates into Distribution Only Bays (continuation)


Customer Supplied Lug
(2) 3/8-16 Hex Nut, P/N 228567100
(2) 3/8" Flat Washer, P/N 214204100
(1) Spacer Busbar, P/N 528806
(1) 1/4-20 x 7/8" Bolt, P/N 227640500
(1) 1/4" Flat Washer, P/N 214110100
Torque to 84 in-lbs.
Busbars P/O Dist. Bay
Torque to 180 in-lbs.
Customer Supplied Lug
(1) 3/8-16 Hex Nut, P/N 228567100
(1) 3/8" Flat Washer, P/N 214204100
(2) 3/8-16 x 1-1/2" Bolt, P/N 227647000
(2) 3/8" Belleville Lock Washer, P/N 214825000
(1) Adapter Busbar, P/N 528794
(1) 3/8-16 x 1" Bolt, P/N 227646600
(1) 3/8" Belleville Lock Washer, P/N 214825000


Customer Supplied Lugs
Torque to 300 in-lbs.
(8) 3/8-16 Hex Nut, P/N 228567100
(8) 3/8" Lock Washer P/N 215111300
(8) 3/8" Flat Washer, P/N 214112100
Busbars P/O Dist. Bay
(1) 1/4-20 x 7/8" Bolt, P/N 227640500
(1) 1/4" Flat Washer, P/N 214110100
Customer Supplied Lugs
(1) 1/4-20 Hex Nut, P/N 228557100
(1) 1/4" Lock Washer P/N 215111100
(1) 1/4" Flat Washer, P/N 214110100
Torque to 84 in-lbs.
(1) Adapter Busbar, P/N 528794
(4) 3/8-16 x 1-1/2" Bolt, P/N 227647000
(4) 3/8" Flat Washer, P/N 214112100

2-Position Lug Adapter Kit P/N 529132

Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt or Nut.

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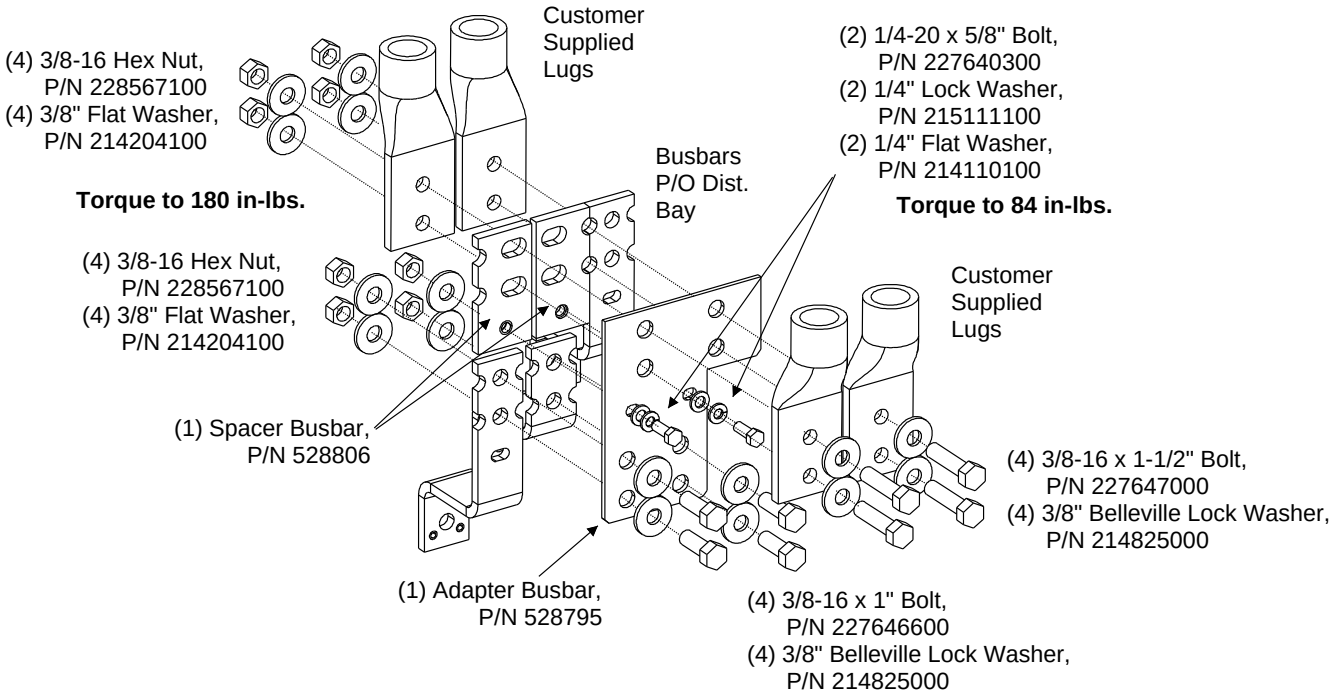
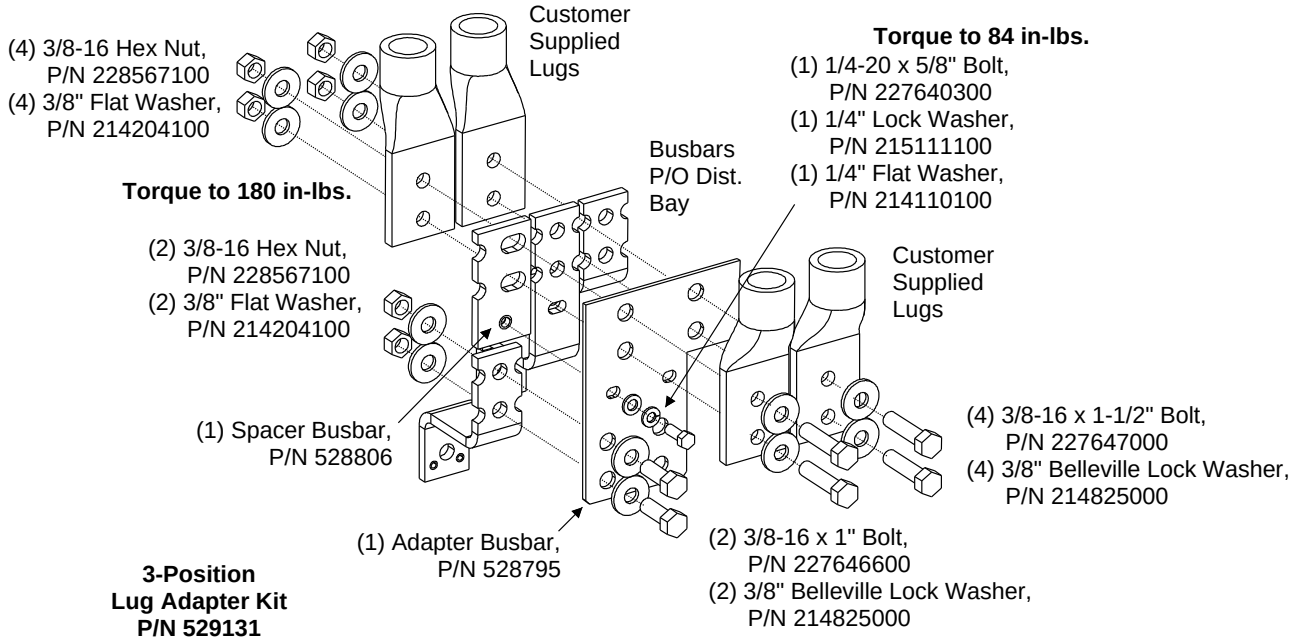
Installing Load Lug Adapter Plates into Distribution Only Bays (continuation)





Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt or Nut.

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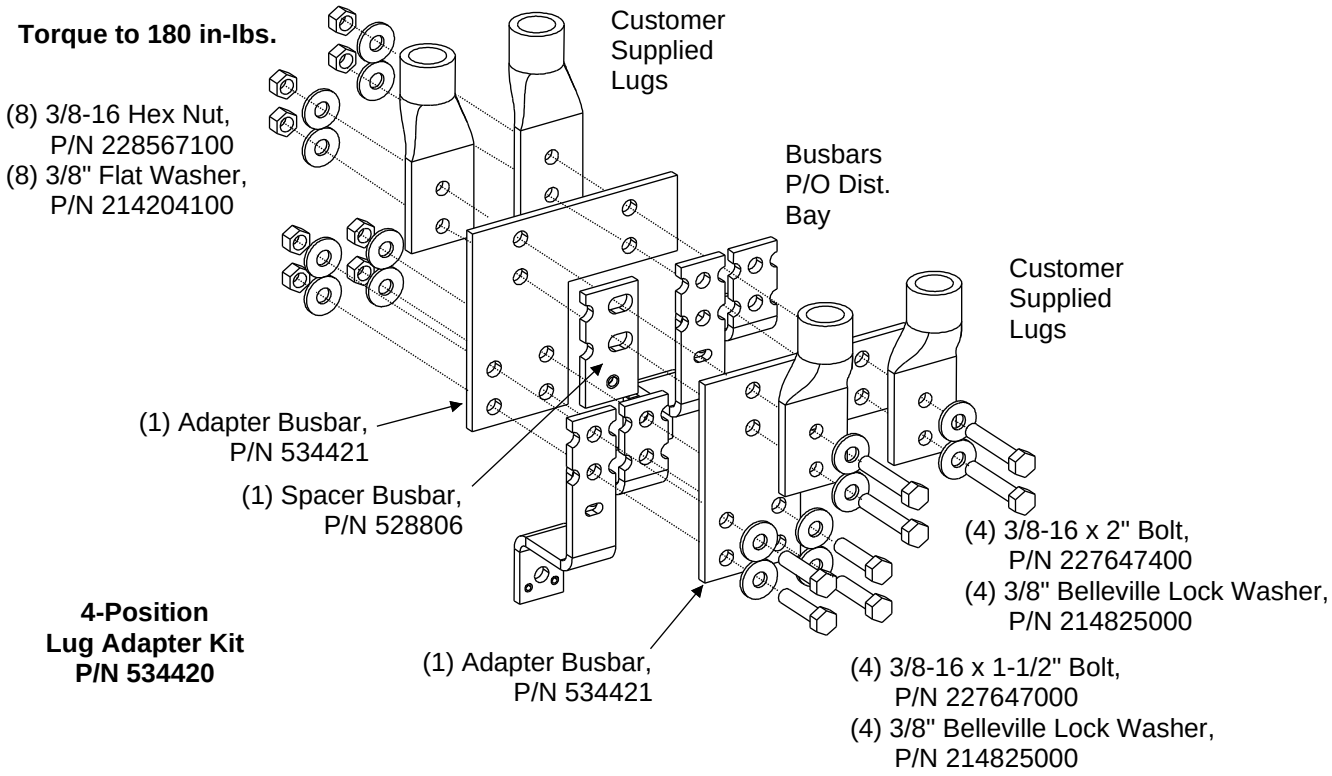
Installing Load Lug Adapter Plates into Distribution Only Bays (continuation)


Torque to 180 in-lbs.
(8) 3/8-16 Hex Nut, P/N 228567100
(8) 3/8" Flat Washer, P/N 214204100
Customer Supplied Lugs
Busbars P/O Dist. Bay
Customer Supplied Lugs
(1) Adapter Busbar, P/N 534421
(1) Spacer Busbar, P/N 528806
(4) 3/8-16 x 2" Bolt, P/N 227647400
(4) 3/8" Belleville Lock Washer, P/N 214825000
4-Position Lug Adapter Kit P/N 534420
(1) Adapter Busbar, P/N 534421
(4) 3/8-16 x 1-1/2" Bolt, P/N 227647000
(4) 3/8" Belleville Lock Washer, P/N 214825000

Note: Apply Electrical Anti-Oxidation Compound to all Busbar Mating Surfaces.

Note: Concave Side of Belleville Washer Faces Busbar, Convex Side Faces Bolt or Nut.

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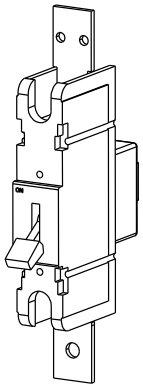
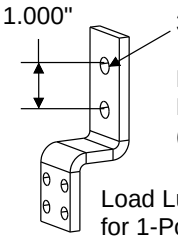
218 Circuit Breakers Lug Adapter Kits



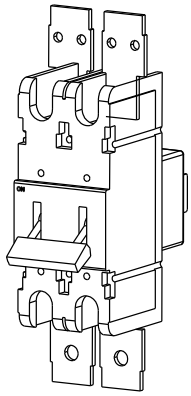
1-Pole 218 Circuit
Breakers Assemblies

Lug Adapter Kits
Power/Distribution Bays



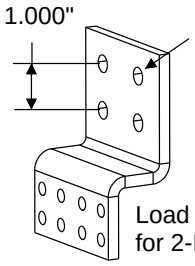
Lug Adapter Kits
Distribution Only Bays

NO LUG ADAPTER KITS
REQUIRED WHEN USED IN
DISTRIBUTION ONLY BAYS

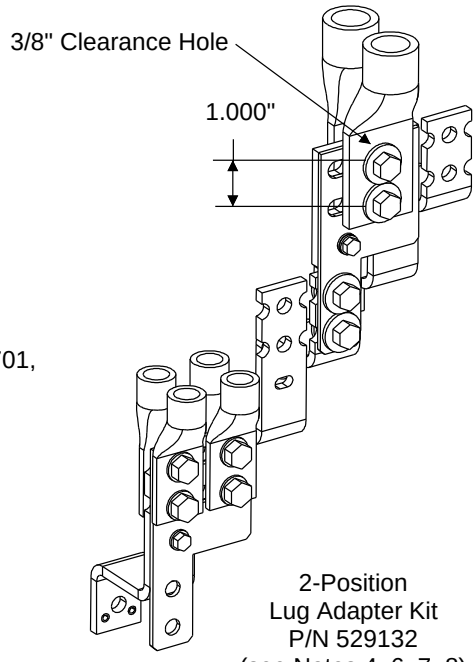


2-Pole 218 Circuit
Breaker Assemblies

Lug Adapter Kits
Power/Distribution Bays



Lug Adapter Kits
Distribution Only Bays



2-Position
Lug Adapter Kit
P/N 529132
(see Notes 4, 6, 7, 8)

Notes:

1. Maximum size of wire to be connected to a single lug position is 750 kcmil.
2. Maximum lug width is 1.937 inches.
3. Kit includes Load Lug Adapter Plate, plus 1/4" and 3/8" mtg. hardware.
4. Lug adapter accepts a maximum of (2) 750 kcmil or (4) 350 kcmil lugs.
5. Lug adapter accepts a maximum of (4) 750 kcmil lugs.
6. Lugs are not part of the kit, shown for illustration only.
7. Bay busbars are not part of the kit, shown for illustration only.
8. Two (2) kits shown for illustration of the kit installed on busbars with tops even with each other and staggered.

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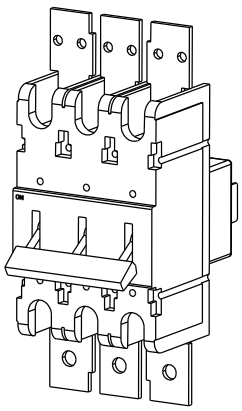
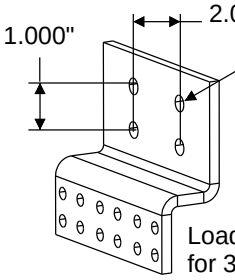
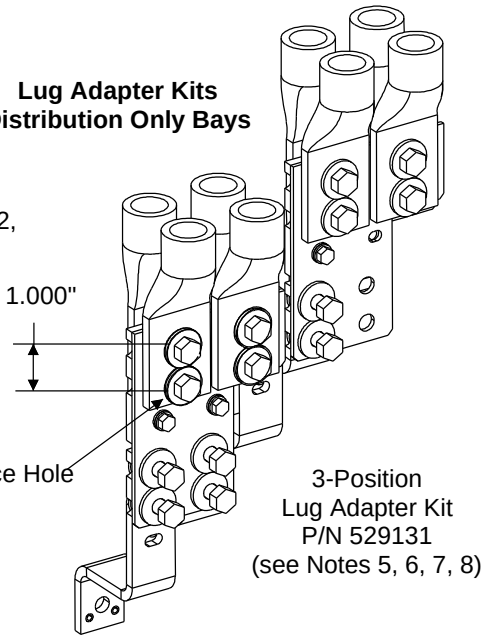


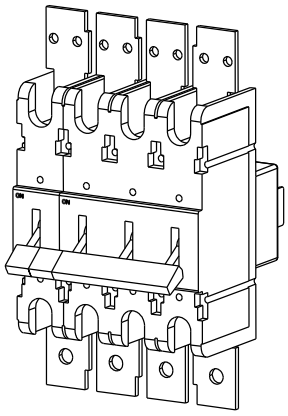
3-Pole 218 Circuit
Breaker Assemblies

Lug Adapter Kits
Power/Distribution Bays



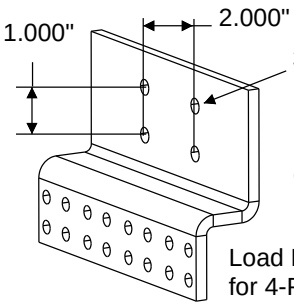
Lug Adapter Kits
Distribution Only Bays



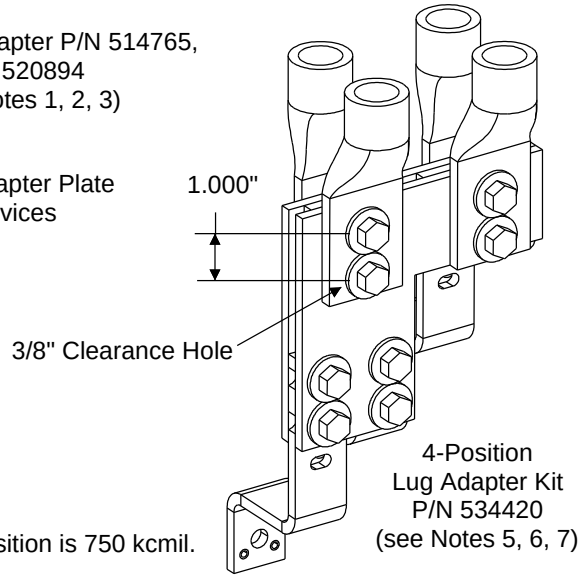


4-Pole 218 Circuit
Breaker Assemblies

Lug Adapter Kits
Power/Distribution Bays



Lug Adapter Kits
Distribution Only Bays



Notes:

1. Maximum size of wire to be connected to a single lug position is 750 kcmil.
2. Maximum lug width is 1.937 inches.
3. Kit includes Load Lug Adapter Plate, plus 1/4" and 3/8" mtg. hardware.
4. Lug adapter accepts a maximum of (2) 750 kcmil or (4) 350 kcmil lugs.
5. Lug adapter accepts a maximum of (4) 750 kcmil lugs.
6. Lugs are not part of the kit, shown for illustration only.
7. Bay busbars are not part of the kit, shown for illustration only.
8. Two (2) kits shown for illustration of the kit installed on busbars with tops even with each other and staggered.

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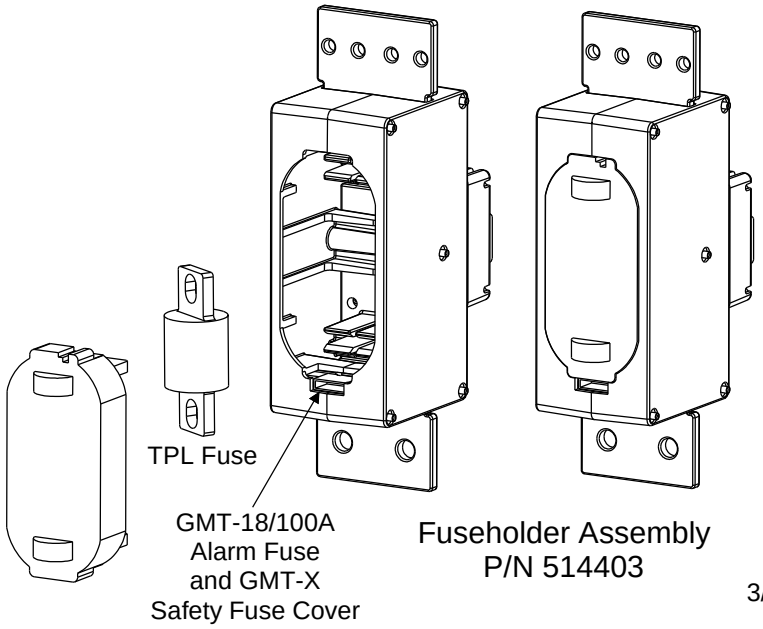
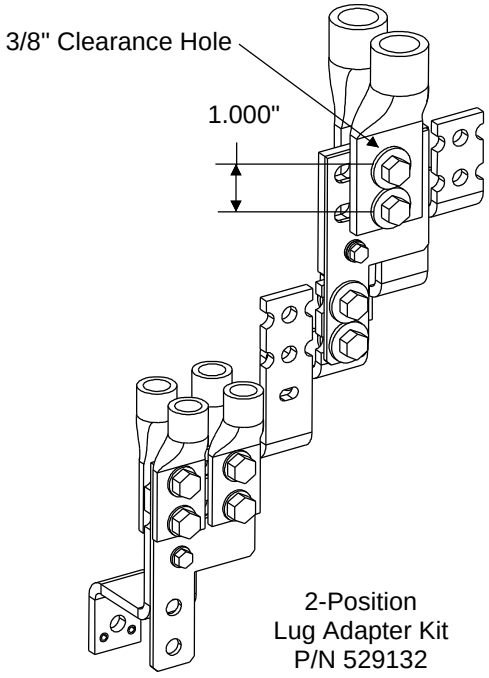
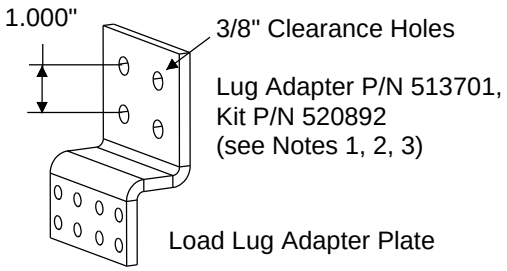
TPL Fuses Lug Adapter Kits



Lug Adapter Kits
Distribution Only Bays



Lug Adapter Kits
Power/Distribution Bays



Notes:

1. Maximum size of wire to be connected to a single lug position is 750 kcmil.
2. Maximum lug width is 1.937 inches.
3. Kit includes Load Lug Adapter Plate, plus 1/4" and 3/8" mtg. hardware.
4. Lug adapter accepts a maximum of (2) 750 kcmil or (4) 350 kcmil lugs.
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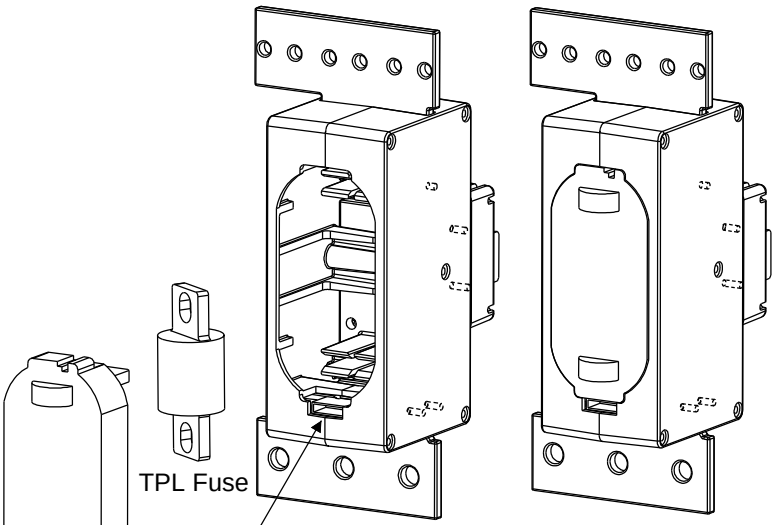
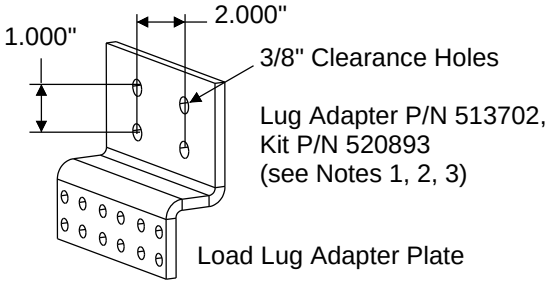
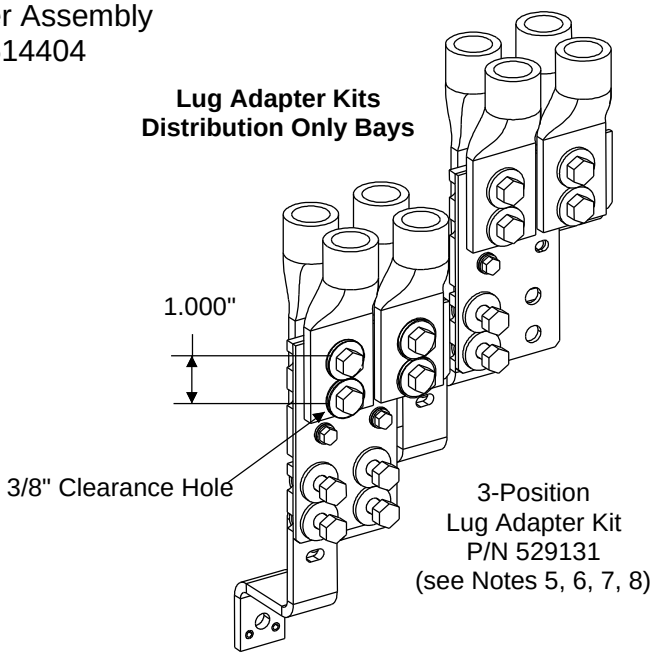


Lug Adapter Kits
Power/Distribution Bays



Lug Adapter Kits
Distribution Only Bays



Notes:

1. Maximum size of wire to be connected to a single lug position is 750 kcmil.
2. Maximum lug width is 1.937 inches.
3. Kit includes Load Lug Adapter Plate, plus 1/4" and 3/8" mtg. hardware.
4. Lug adapter accepts a maximum of (2) 750 kcmil or (4) 350 kcmil lugs.
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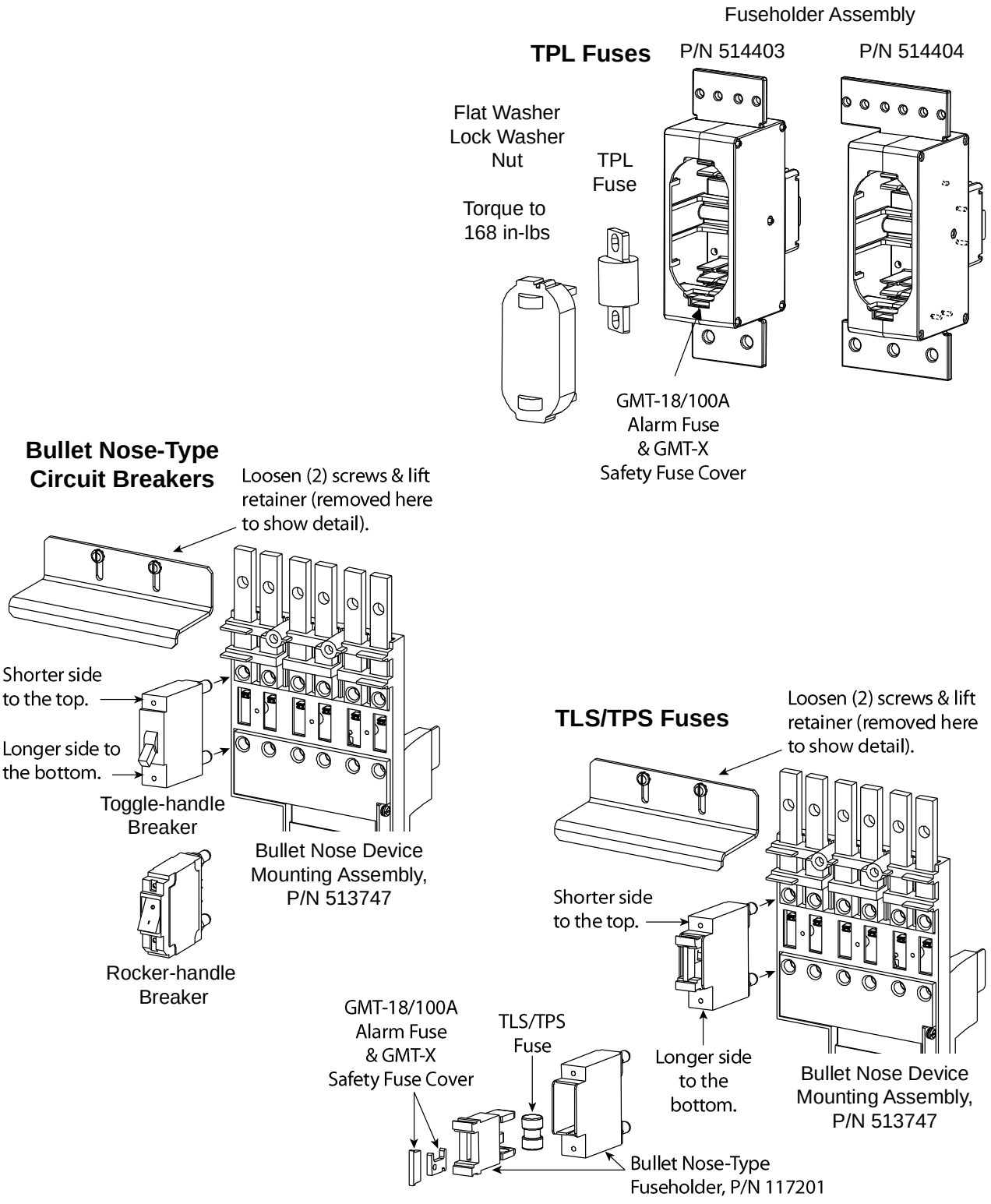
Installing TPL Fuses, TLS/TPS Fuses, and Bullet Nose-Type Circuit Breakers



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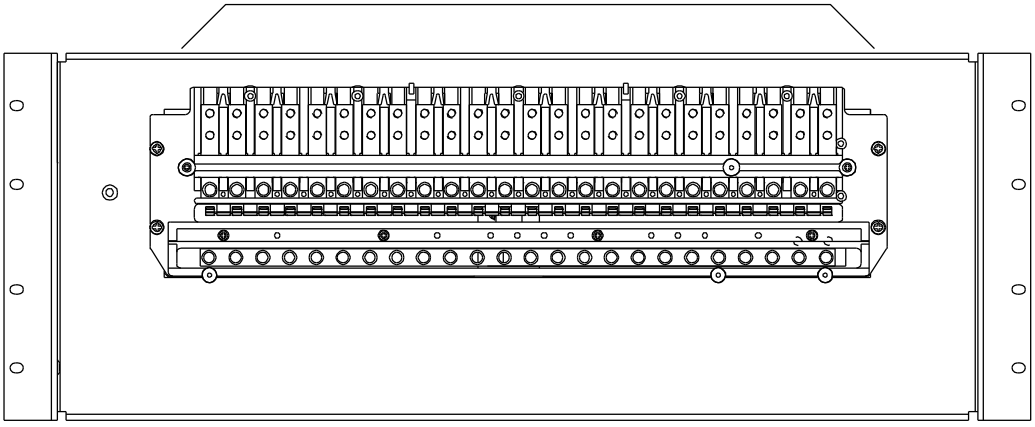
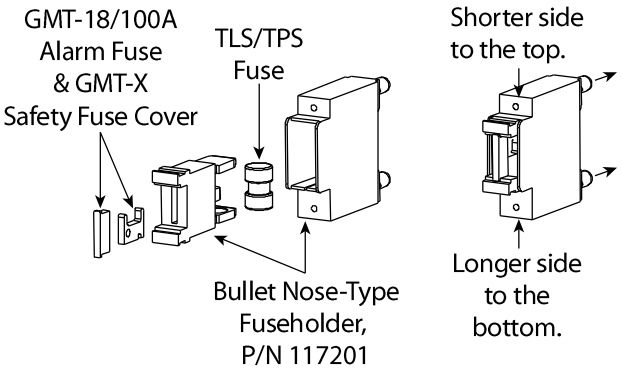
Installing TPL Fuses, TLS/TPS Fuses, and Bullet Nose-Type Circuit Breakers

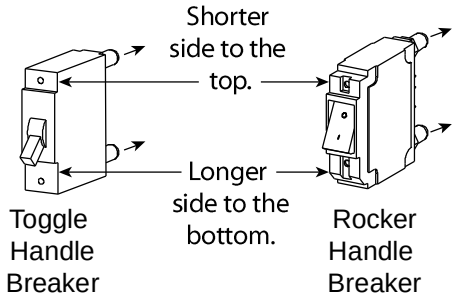
Note: Load leads are connected to load busbars. These busbars provide 1/4-20 threaded holes on 5/8" centers for installation of customer provided two-hole lugs. Customer must provide lug mounting bolts and additional hardware. Bolt length: 3/4".



TLS/TPS Fuses



Bullet Nose-Type Circuit Breakers



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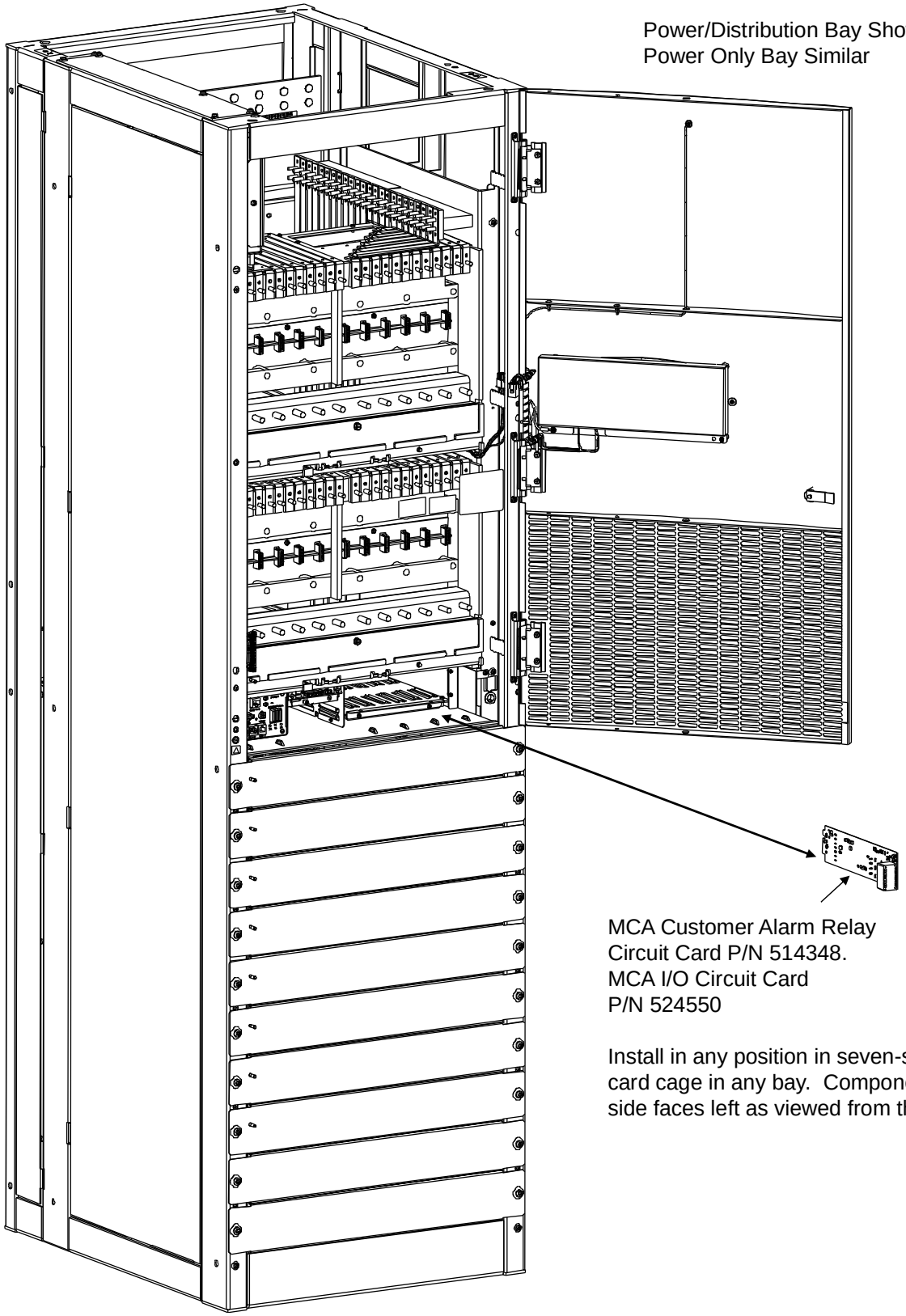
Installing the MCA Customer Alarm Relay Circuit Card(s) and MCA I/O Circuit Card(s) into Power/Distribution and Power Only Bays



Power/Distribution Bay Shown,
Power Only Bay Similar

MCA Customer Alarm Relay
Circuit Card P/N 514348.
MCA I/O Circuit Card
P/N 524550

Install in any position in seven-slot card cage in any bay. Component side faces left as viewed from the front.

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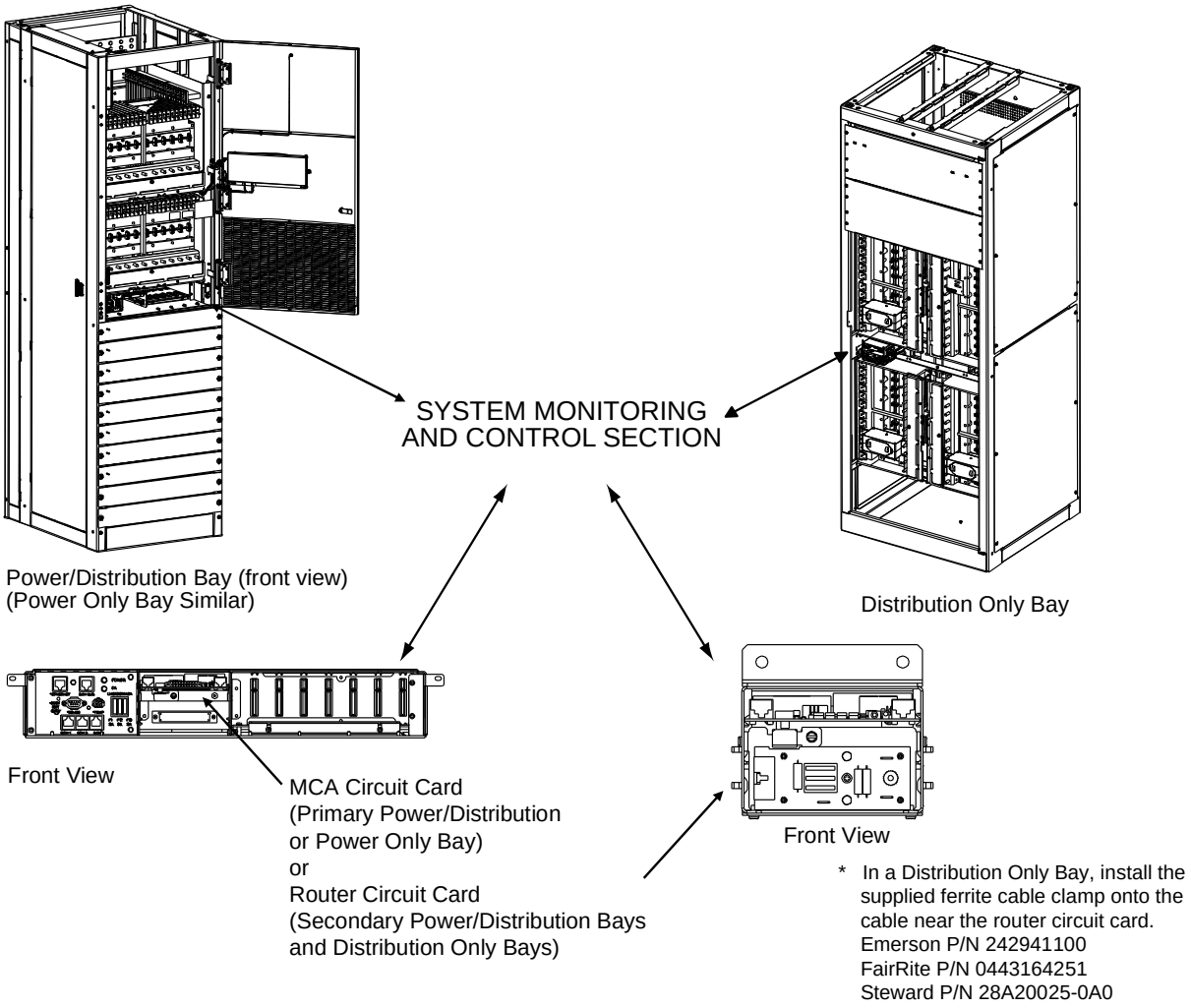
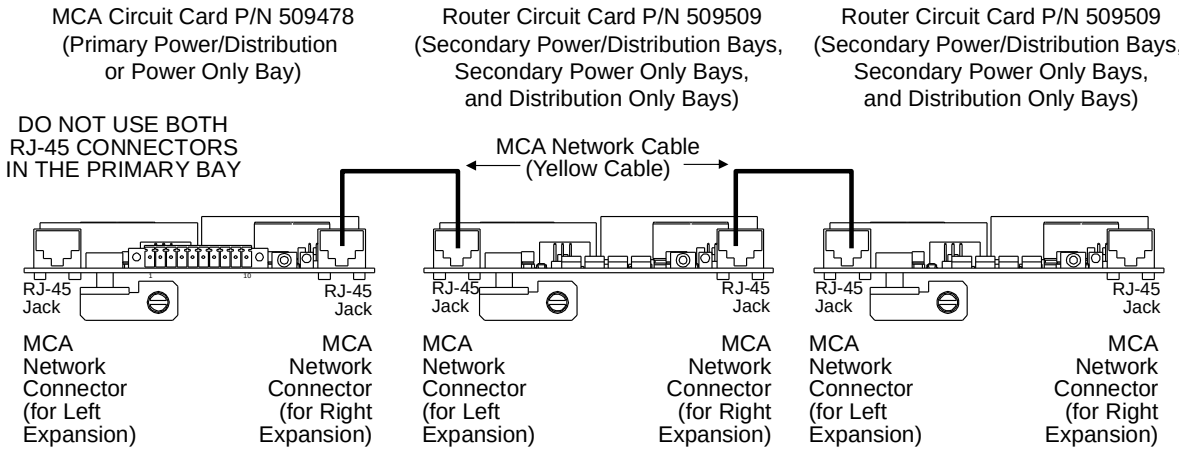
MCA Network Bay-Bay Interconnections





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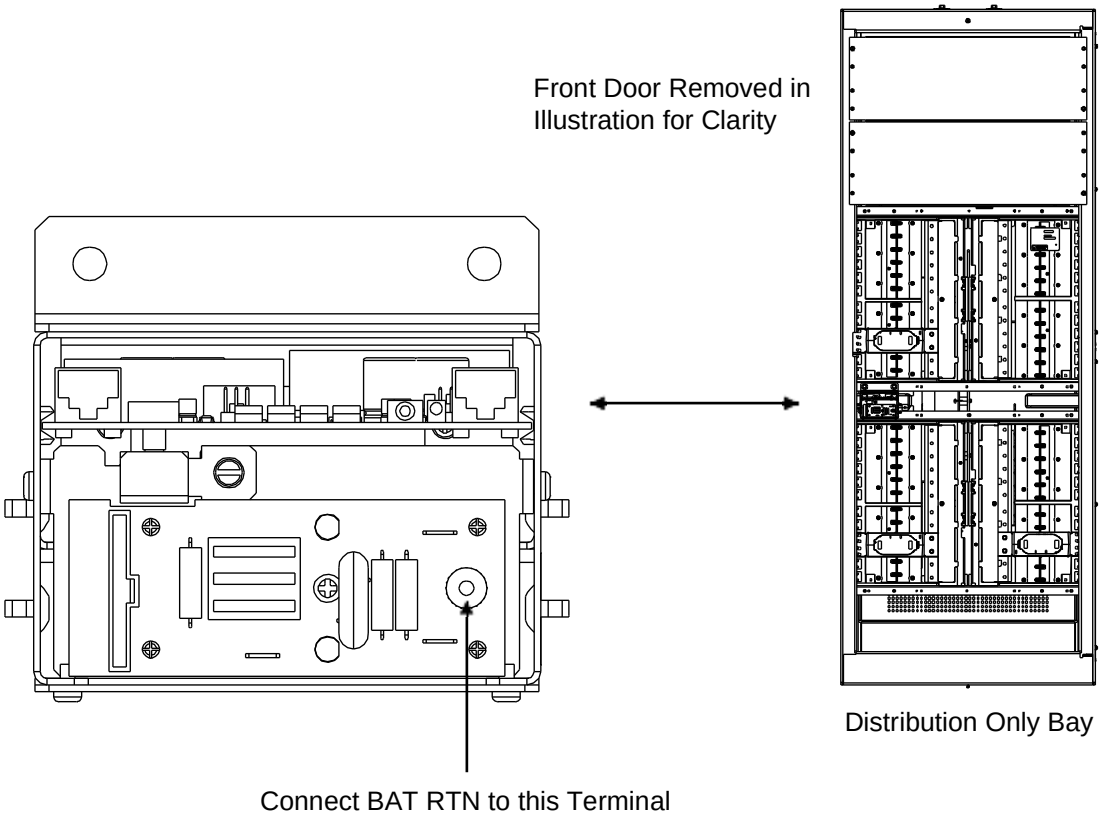
Distribution Only Bay RTN Connection to System Monitoring and Control Section



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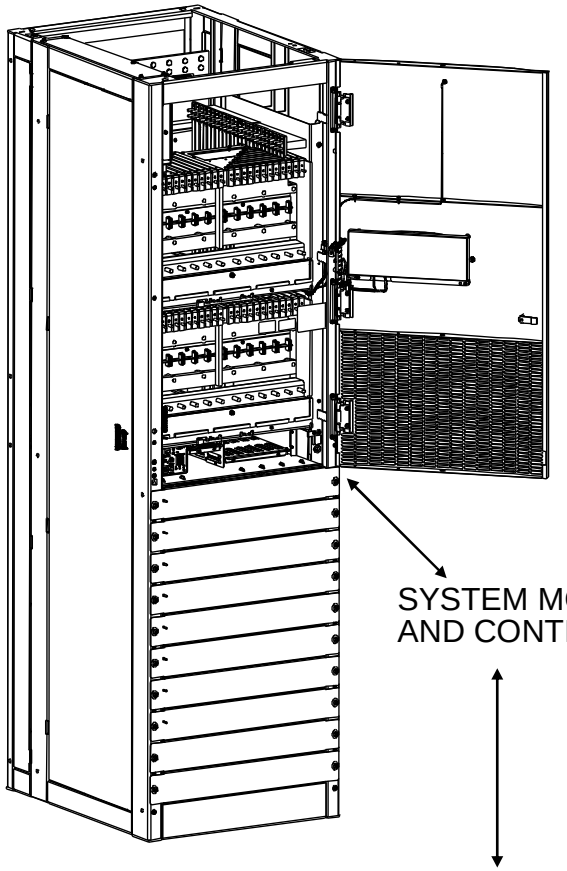
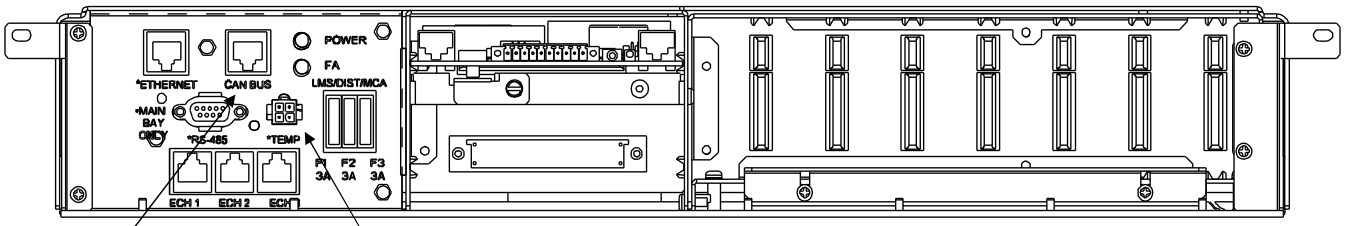
MCA Battery Charge Digital Temperature Compensation Probe Connection to Primary Power/Distribution and Power Only Bays



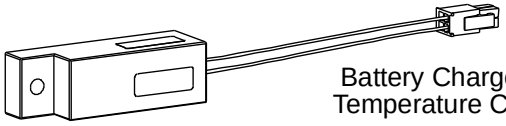
Power/Distribution Bay Shown,
Power Only Bay Similar

SYSTEM MONITORING
AND CONTROL SECTION



External
CAN BUS
Port

MCA Battery Charge Digital Temperature
Compensation Probe Connector
(Primary Bay Only)



Battery Charge Digital
Temperature Compensation Probe

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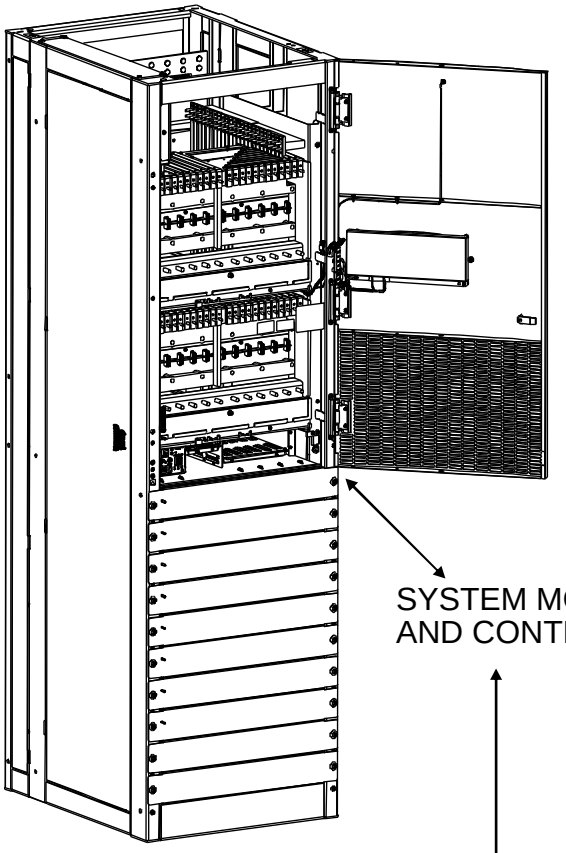
MCA External Alarm, Reference, and Control Connections to Primary Power/Distribution and Power Only Bays and I/O Card Connections to Primary and Secondary Power/Distribution and Power Only Bays

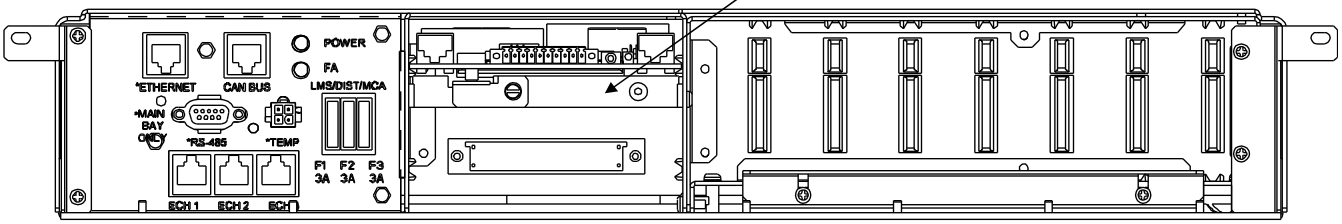


Power/Distribution Bay Shown,
Power Only Bay Similar

SYSTEM MONITORING
AND CONTROL SECTION

MCA Circuit Card
(Primary Bay)

(See Detail A)



Seven-Slot Card Cage for MCA Circuit Cards
and/or LMS Input/Output (I/O) Circuit Cards.

(See Detail B)

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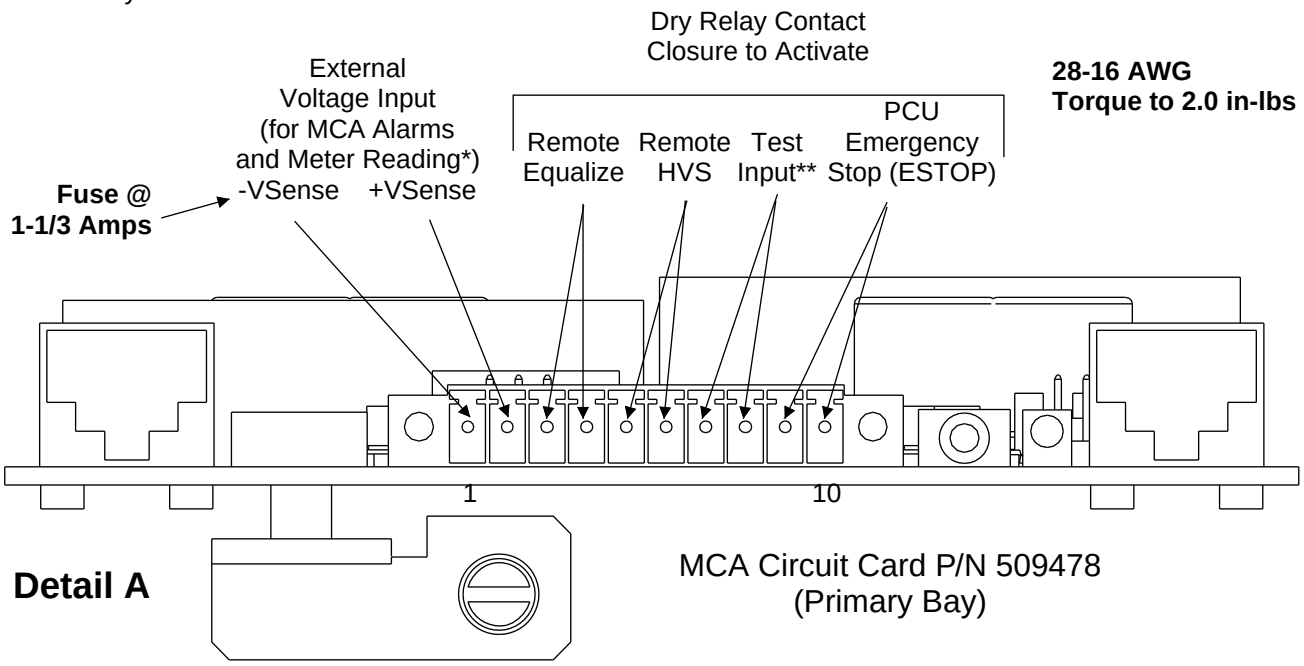
* Automatic internal sense when not connected. Note: If connected and removed, external A/D Volt Alarm activates. Clear alarm by updating inventory.

** Apply Test contact closure, then apply HVS or ESTOP closure to test these circuits. See MCA display to verify circuits operational.



MCA Circuit Card P/N 509478
(Primary Bay)

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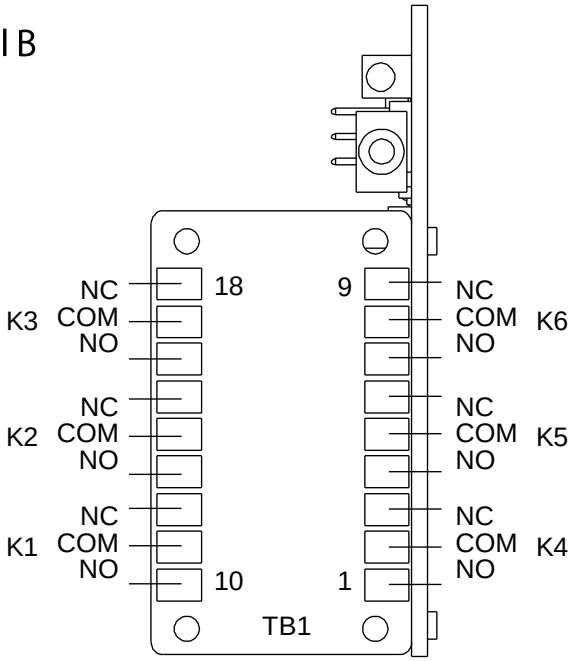
Detail B

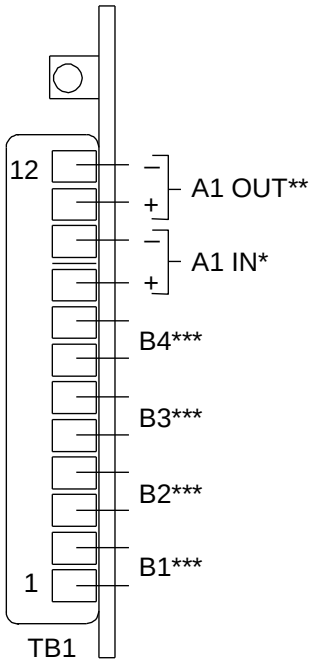


MCA Customer Alarm
Relay Circuit Card P/N 514348
(Primary and/or Secondary Bays)

28-16 AWG
Torque to 2.0 in-lbs

Notes
NC = Normally Closed
COM = Common
NO = Normally Open

All relay contacts are shown with the relay deenergized.



MCA I/O Circuit Cards
(Primary and/or Secondary Bays)
(P/N 524550, 1 analog input, 1 analog output, 4 binary inputs)

28-16 AWG
Torque to 2.0 in-lbs

* 0-50 mv DC Shunt Input
** 0-50 mv DC Output for Remote Plant Output Current Monitoring
*** Dry Contacts, Circuit Closure to Activate Alarm

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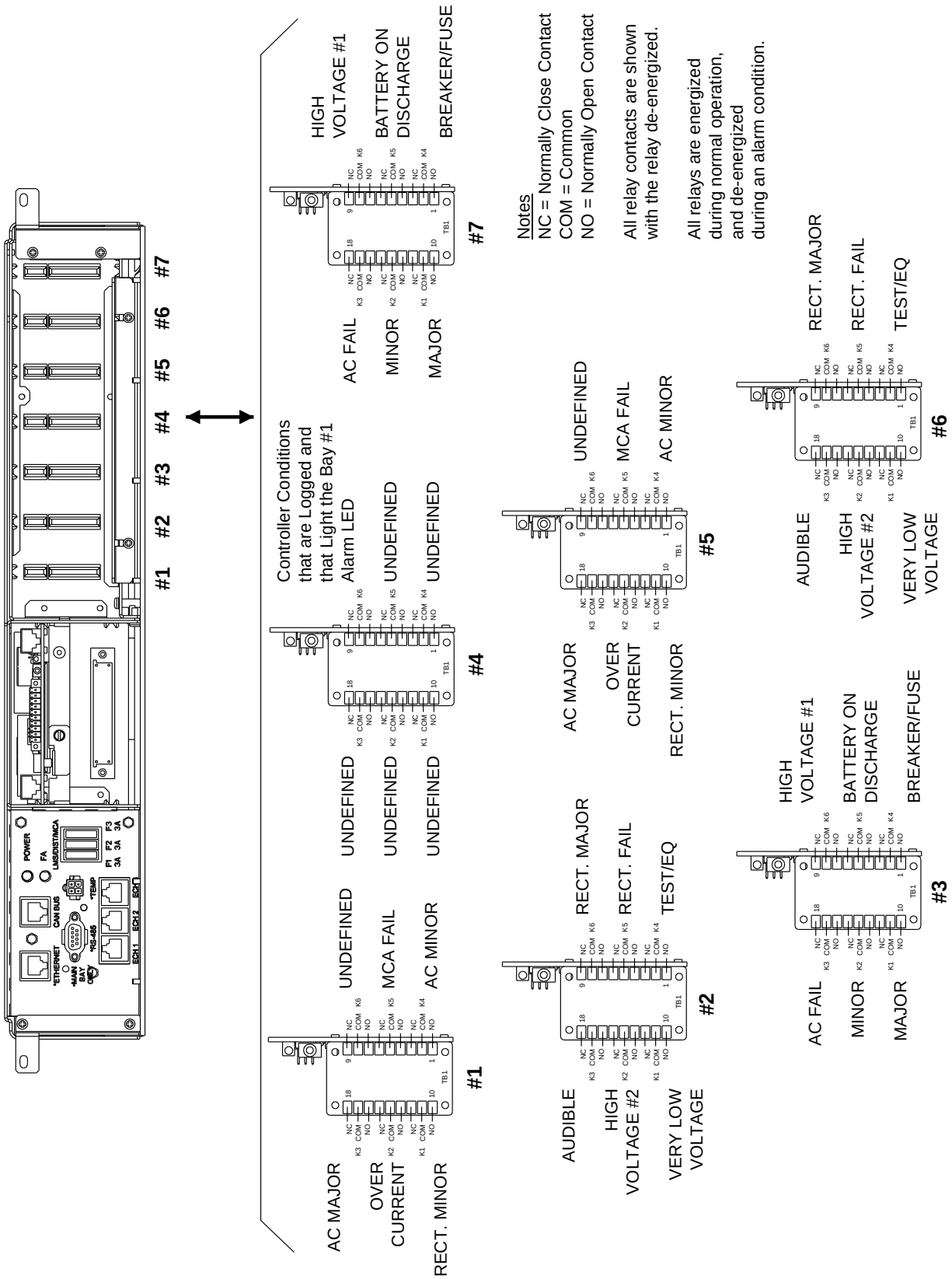
Default MCA Customer Alarm Relay Assignments



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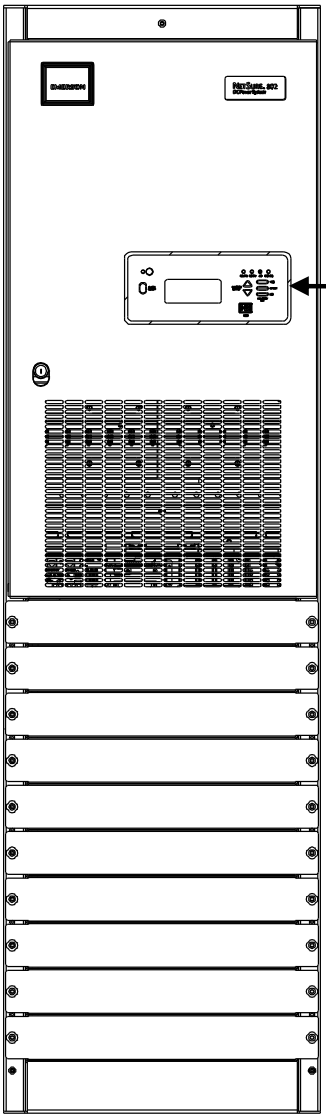
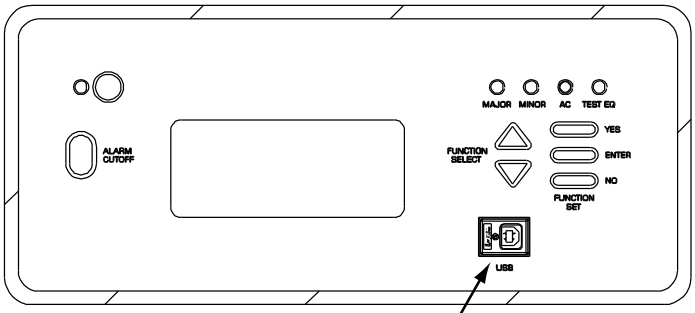
MCA Local Control Panel and Display and LMS Local Port

Detail A



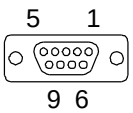
Primary
Bay



LMS LOCAL PORT
(USB)
(active only if
optional LMS installed)

(Provided via a USB to RS-232 Port Adapter Unit)

Power/Distribution Bay Shown,
Power Only Bay Similar



Mating Connector
in Power System Wire Harness
(9-Pin Female D-Type Jack)

If required to connect to a serial port, disconnect the factory plug to the “USB to RS-232 Port Adapter Unit” and connect to this plug.

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LMS Local Port

Introduction

The LMS Local Port is provided via a USB to RS-232 Port Adapter Unit. The proper device driver must be installed on the computer to be connected to the USB port. Use one of the following procedures to install the device driver.

Installing the USB Device Driver from the Furnished CD

A device driver CD is supplied with the USB to RS-232 Port Adapter Unit. The proper driver must be installed on the computer to be connected to the USB port. Use the provided CD to install the driver.

Downloading the USB Driver from the Web

1) Go to this link http://vscom.de/downloadcenter.htm.
2) Select “USB to Serial Drivers” from the Product Category drop-down menu.
3) Select your product model’s “Driver and Documentation” to download the files.
4) Select your computer’s operating system.
5) Run or save the application.

Setting up your Computer to Access the Power System

1) Select Hyper terminal.
2) Connect using one of the unused COM ports. (e.g. COM 5)
3) Set Bit Per Second to 19200.
4) Set Data Bits to 8.
5) Set Parity to None.
6) Set Stop bits to 1.
7) Set Flow control to Hardware.
8) Select OK.
9) In Hyper terminal press ENTER.
10) Enter the password 6.
11) Enter “?” to see commands.

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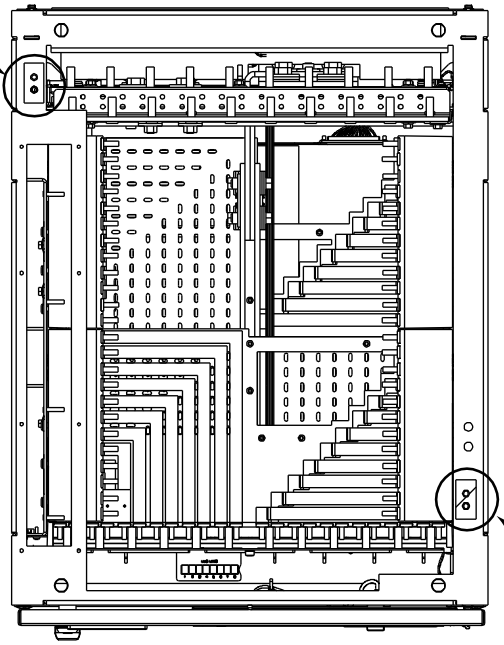
Power/Distribution and Power Only Bays Frame Grounding Connection

Two holes with 1/4-20 captive nuts provided for installation of customer provided two-hole lug with 1/4" bolt clearance holes on 5/8" centers

Recm. Torque
1/4" Hardware using Belleville Lock Washer
60 in-lbs.



Top View

Two holes with 1/4-20 captive nuts provided for installation of customer provided two-hole lug with 1/4" bolt clearance holes on 5/8" centers

Power/Distribution Bay Shown,
Power Only Bay Similar

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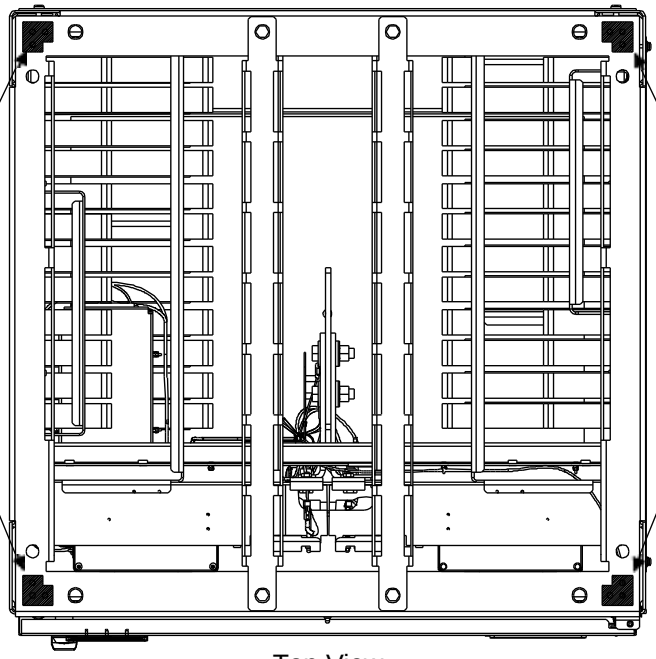
Distribution Only Bay Frame Grounding Connection


1/4" clearance holes on 5/8” centers are provided for installation of customer provided two-hole lug.
1/4" clearance holes on 5/8” centers are provided for installation of customer provided two-hole lug.

Top View
Distribution Only Bay

Recm. Torque

1/4” Hardware using Belleville Lock Washer 60 in-lbs.

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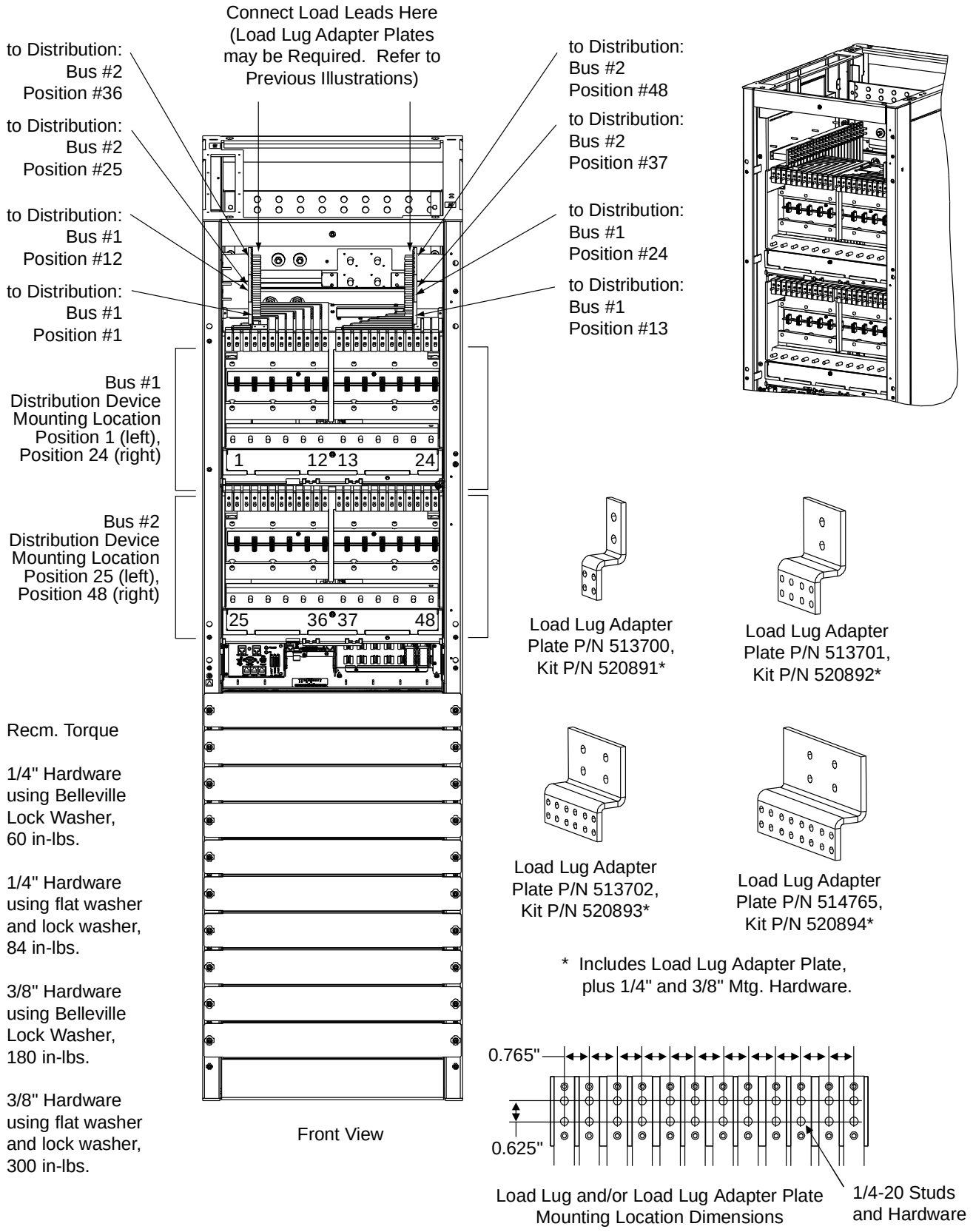
Load Connections to Power/Distribution Bays



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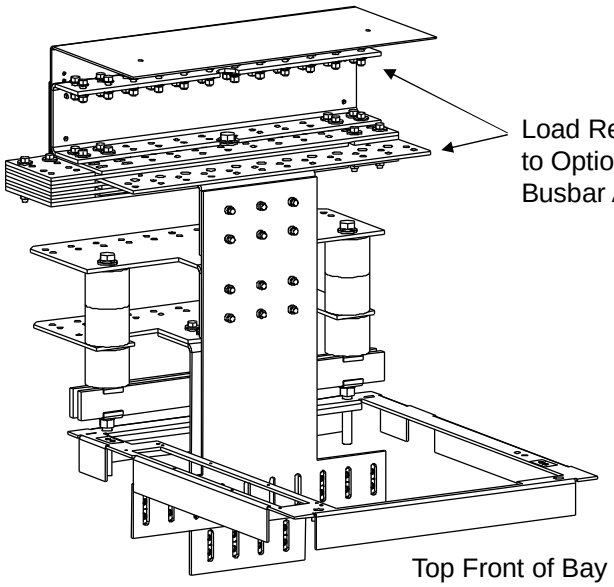

Recm. Torque

3/8" Hardware using Belleville Lock Washer, 180 in-lbs.

3/8" Hardware using flat washer and lock washer, 300 in-lbs.

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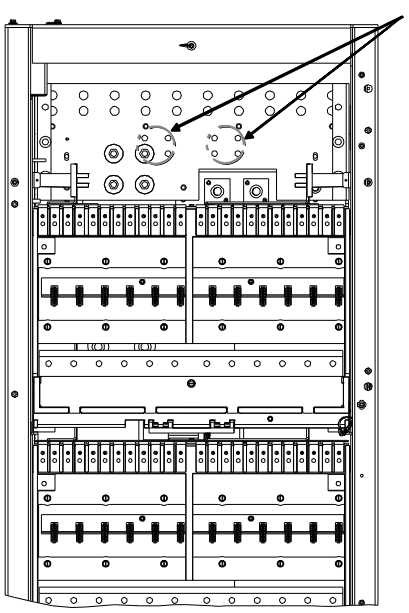
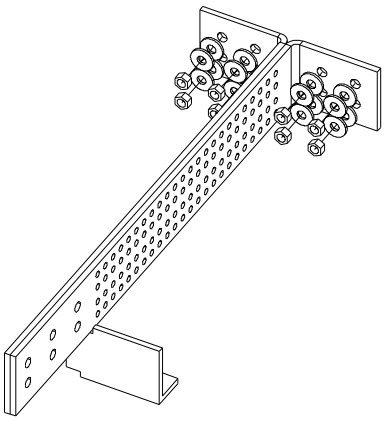
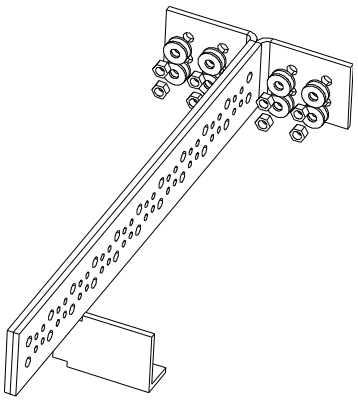
Load Connections to Power/Distribution Bays Optional Internal Ground (Load Return) Busbar Assembly

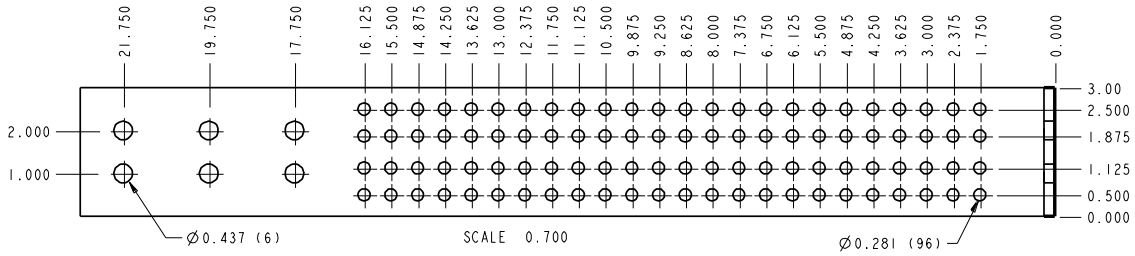




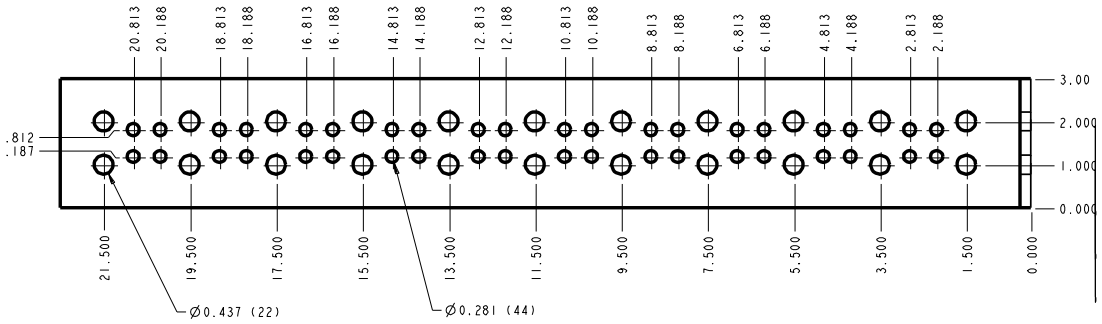
Internal Ground Busbar
Assembly P/N 554862



Internal Ground Busbar
Assembly P/N 555214



Internal Ground Busbar Assembly P/N 554862



Internal Ground Busbar Assembly P/N 555214

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Load Connections to Distribution Only Bays

Connect Load Leads Here (Load Lug Adapter Plates May Be Required, Refer to Previous Illustrations)

to Distribution: Bus #2 Position #13

to Distribution: Bus #2 Position #18

to Distribution: Bus #2 Position #19

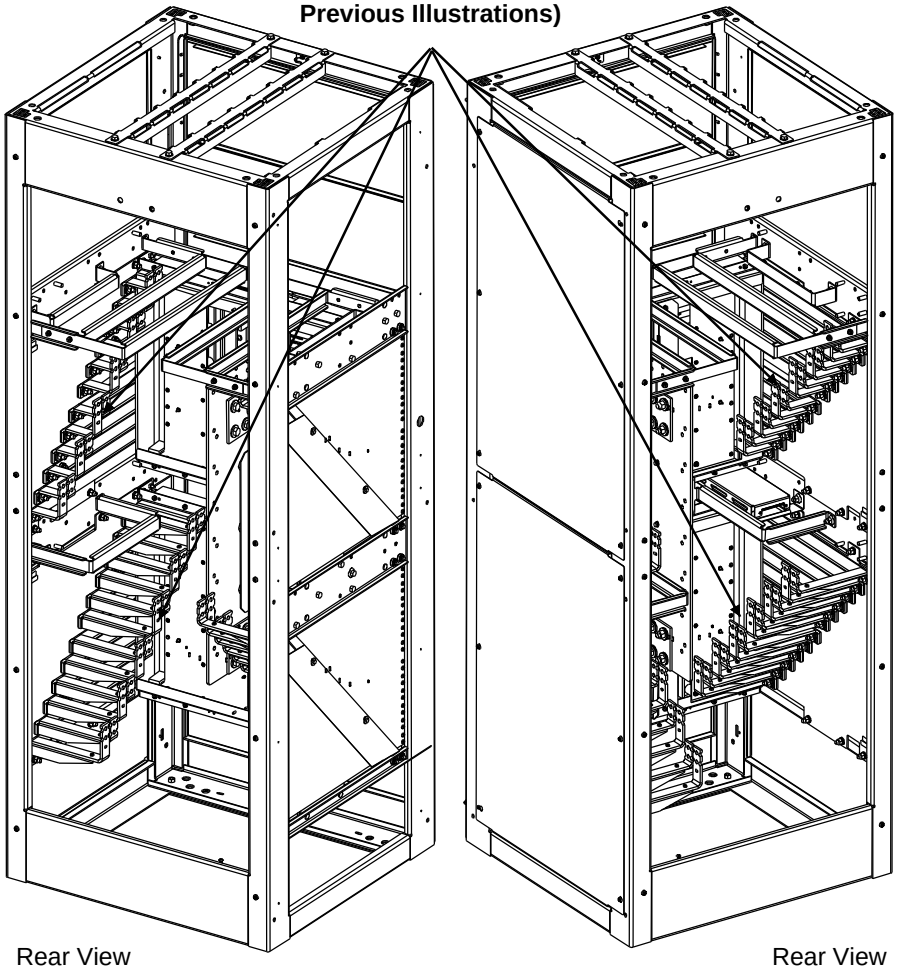
to Distribution: Bus #2 Position #24

to Distribution: Bus #4 Position #37

to Distribution: Bus #4 Position #42

to Distribution: Bus #4 Position #43

to Distribution: Bus #4 Position #48



to Distribution: Bus #1 Position #12

to Distribution: Bus #1 Position #7

to Distribution: Bus #1 Position #6

to Distribution: Bus #1 Position #1

to Distribution: Bus #3 Position #36

to Distribution: Bus #3 Position #31

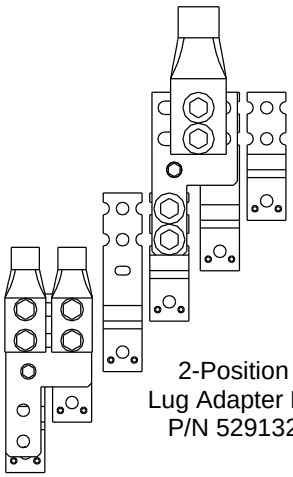
to Distribution: Bus #3 Position #30

to Distribution: Bus #3 Position #25

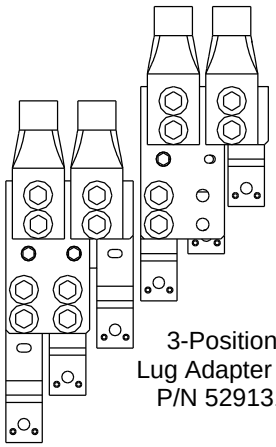
Rear View

Rear View

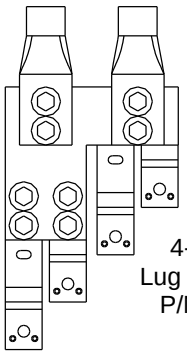
Rear cover panels removed in illustration for clarity.



2-Position Lug Adapter Kit P/N 529132



3-Position Lug Adapter Kit P/N 529131



4-Position Lug Adapter Kit P/N 534420

Recm. Torque

3/8" Hardware using Belleville Lock Washer, 180 in-lbs

3/8" Hardware using flat washer and lock washer, 300 in-lbs

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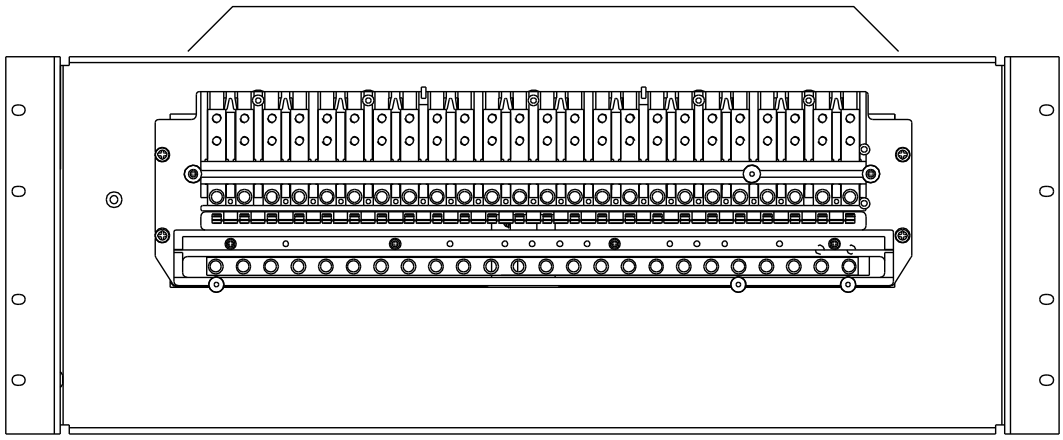
Load Connections to Distribution Only Bay Optional Bullet Device Panel

Note: Load leads are connected to load busbars. These busbars provide 1/4-20 threaded holes on 5/8" centers for installation of customer provided two-hole lugs. Customer must provide lug mounting bolts and additional hardware. Bolt length: 3/4".

Recm. Torque

1/4" Hardware using Belleville Lock Washer, 60 in-lbs

1/4" Hardware using flat washer and lock washer, 84 in-lbs



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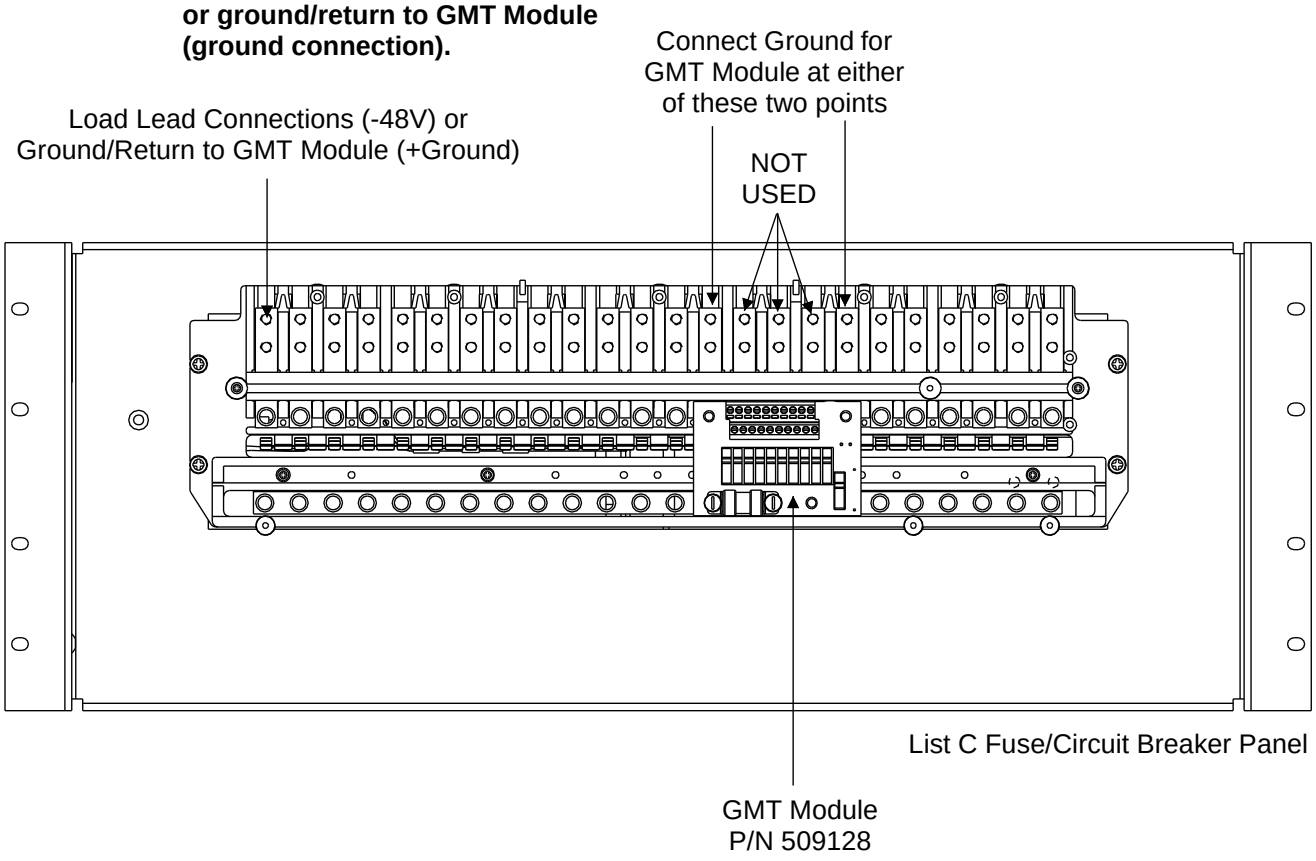
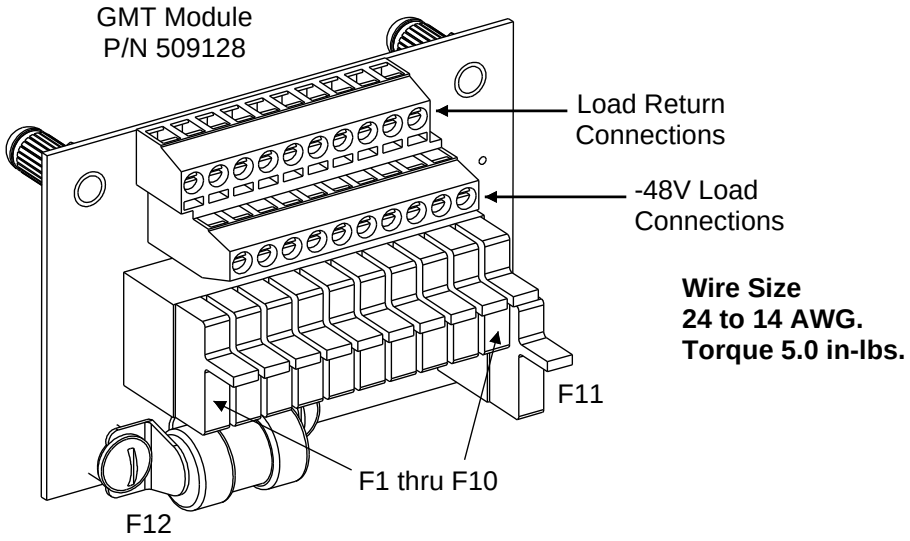
Installing and Wiring Optional Bullet Nose-Type 10-Position GMT Fuse Module (P/N 509128)

DANGER

Ensure leads are connected to proper polarity for the device installed, either a Distribution Device (load lead connection) or ground/return to GMT Module (ground connection).


Connect Ground for GMT Module at either of these two points
Load Lead Connections (-48V) or Ground/Return to GMT Module (+Ground)
NOT USED
List C Fuse/Circuit Breaker Panel
GMT Module P/N 509128



Wire Size
24 to 14 AWG.
Torque 5.0 in-lbs.

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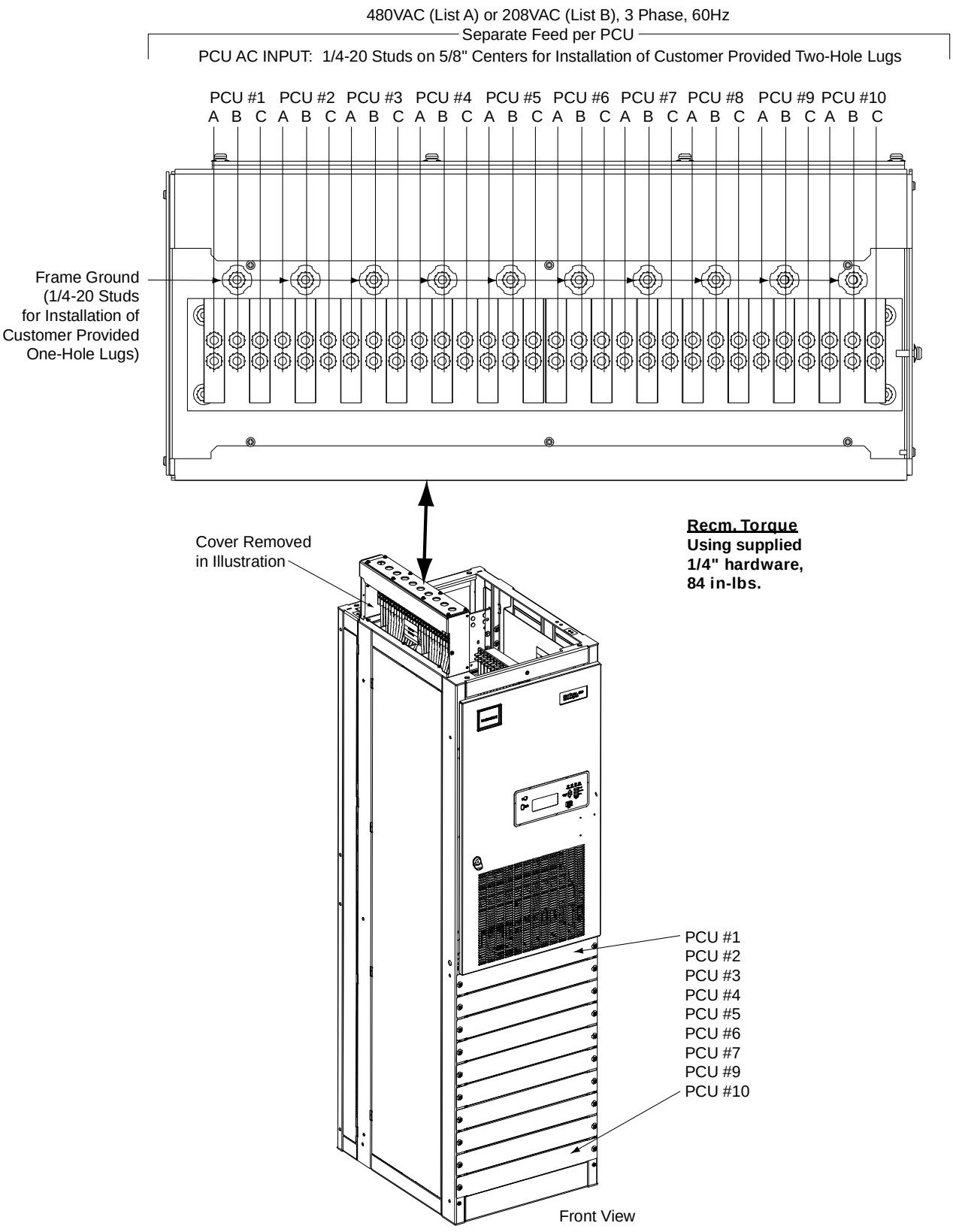
AC Input Connections to Lists 1 and 11 Power/Distribution Bays (w/out PDSC) (Ten AC Feeds)


480VAC (List A) or 208VAC (List B), 3 Phase, 60Hz
Separate Feed per PCU
PCU AC INPUT: 1/4-20 Studs on 5/8" Centers for Installation of Customer Provided Two-Hole Lugs
PCU #1 PCU #2 PCU #3 PCU #4 PCU #5 PCU #6 PCU #7 PCU #8 PCU #9 PCU #10
A B C A B C A B C A B C A B C A B C A B C A B C A B C A B C
Frame Ground (1/4-20 Studs for Installation of Customer Provided One-Hole Lugs)
Cover Removed in Illustration
Recm. Torque
Using supplied 1/4" hardware, 84 in-lbs.
PCU #1
PCU #2
PCU #3
PCU #4
PCU #5
PCU #6
PCU #7
PCU #9
PCU #10
Front View

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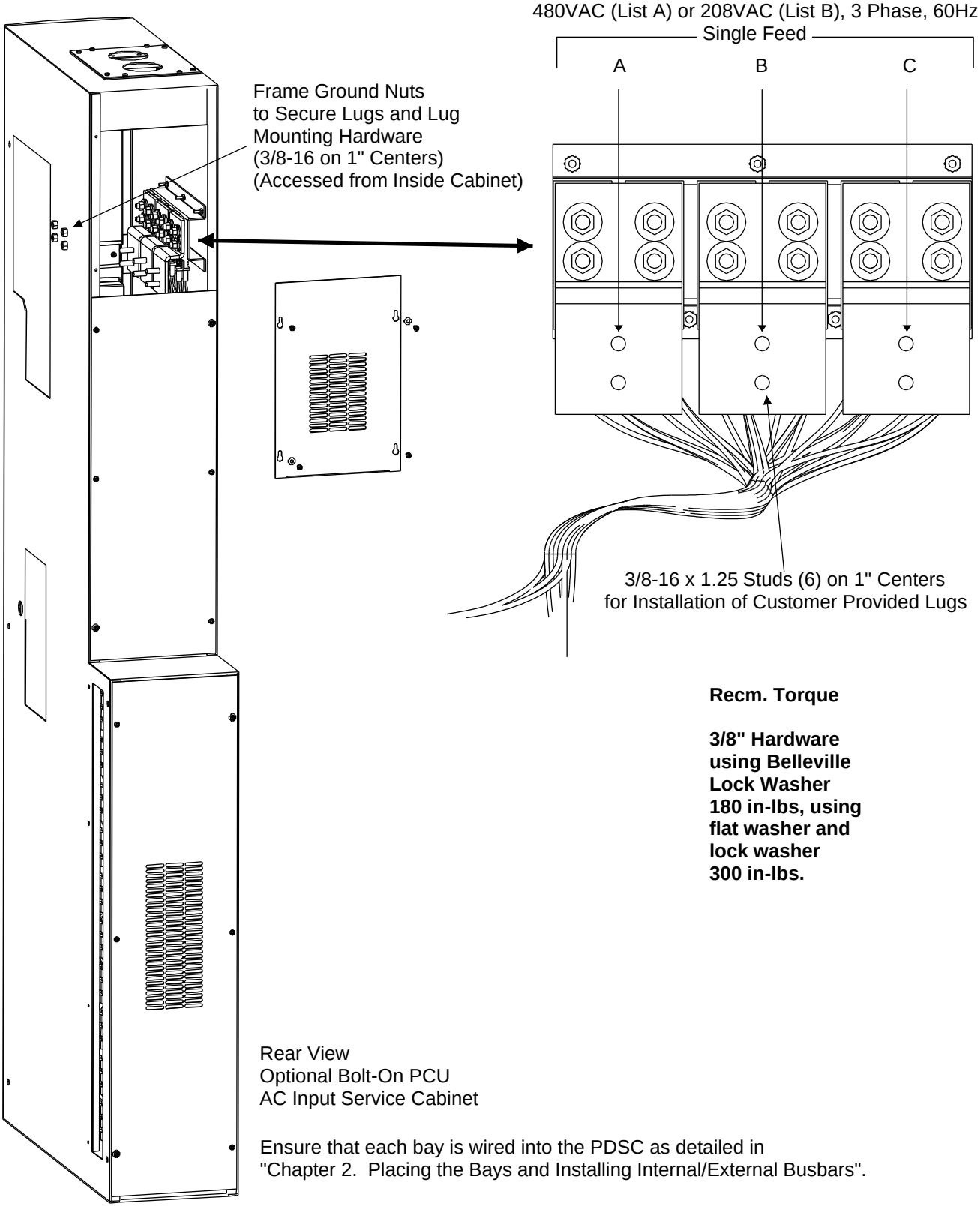
AC Input Connections to Lists 2 and 12 Power/Distribution Bays (with PDSC)
(One AC Feed)



Recm. Torque

3/8" Hardware using Belleville Lock Washer 180 in-lbs, using flat washer and lock washer 300 in-lbs.

Rear View
Optional Bolt-On PCU
AC Input Service Cabinet

Ensure that each bay is wired into the PDSC as detailed in "Chapter 2. Placing the Bays and Installing Internal/External Busbars".

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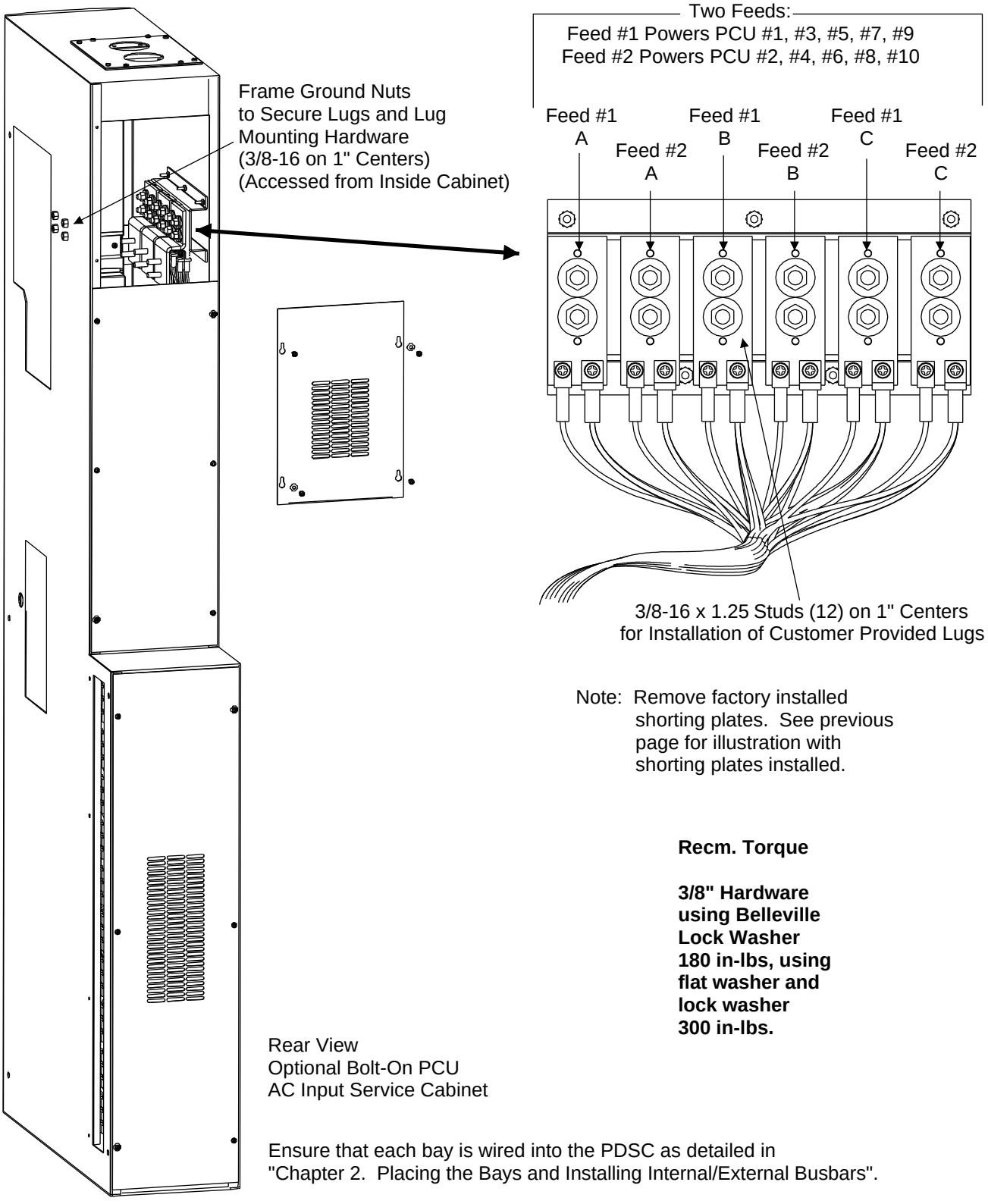
AC Input Connections to Lists 2 and 12 Power/Distribution Bays (with PDSC) (Two AC Feeds)


480VAC (List A) or 208VAC (List B), 3 Phase, 60Hz
Two Feeds:
Feed #1 Powers PCU #1, #3, #5, #7, #9
Feed #2 Powers PCU #2, #4, #6, #8, #10
Frame Ground Nuts
to Secure Lugs and Lug
Mounting Hardware
(3/8-16 on 1" Centers)
(Accessed from Inside Cabinet)
Feed #1 A
Feed #2 A
Feed #1 B
Feed #2 B
Feed #1 C
Feed #2 C
3/8-16 x 1.25 Studs (12) on 1" Centers
for Installation of Customer Provided Lugs

Note: Remove factory installed shorting plates. See previous page for illustration with shorting plates installed.

Recm. Torque

3/8" Hardware using Belleville Lock Washer 180 in-lbs, using flat washer and lock washer 300 in-lbs.

Rear View
Optional Bolt-On PCU
AC Input Service Cabinet

Ensure that each bay is wired into the PDSC as detailed in "Chapter 2. Placing the Bays and Installing Internal/External Busbars".

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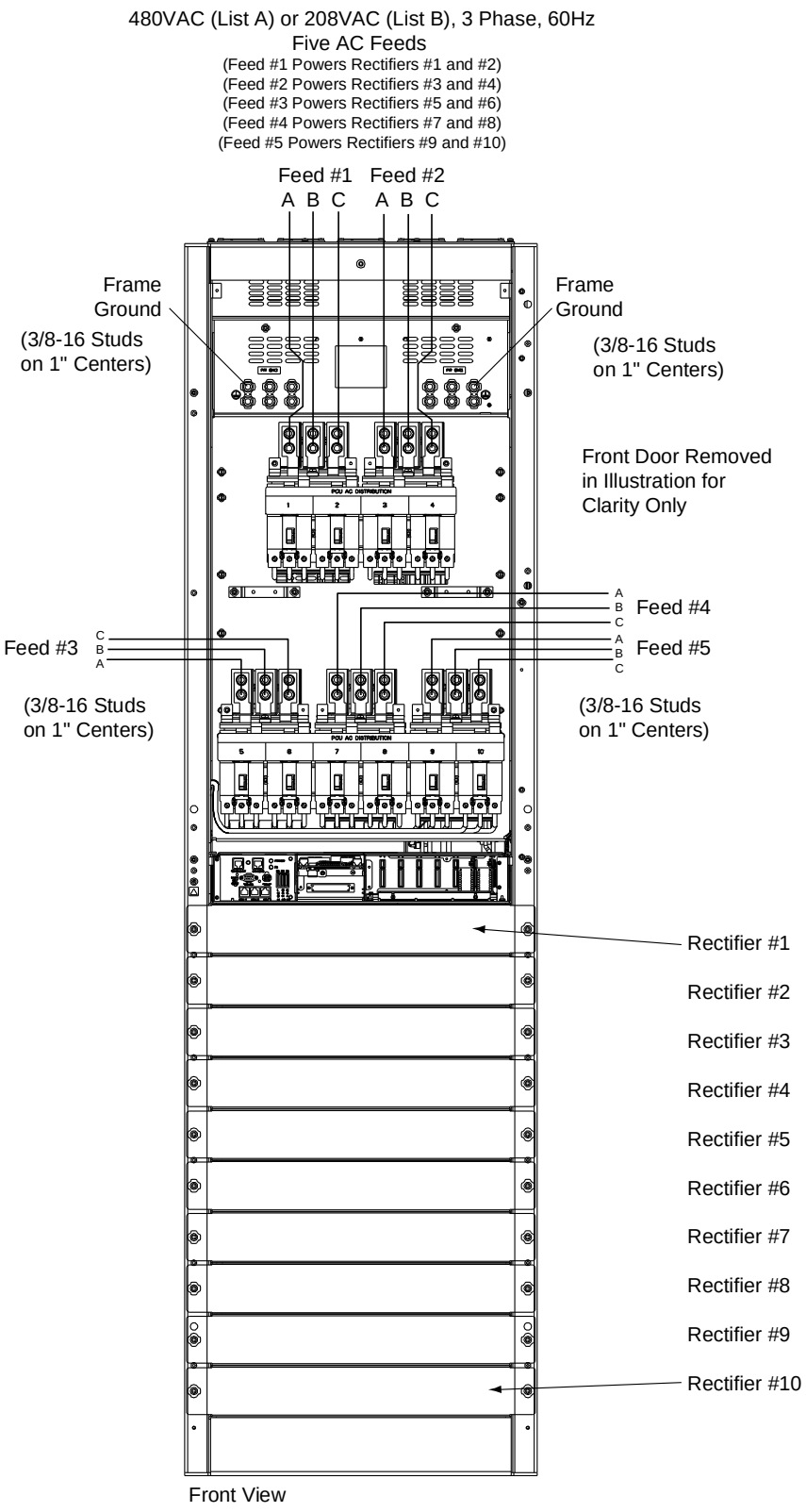
AC Input Connections to Lists 3 and 13 Power Only Bays (Five AC Feeds)



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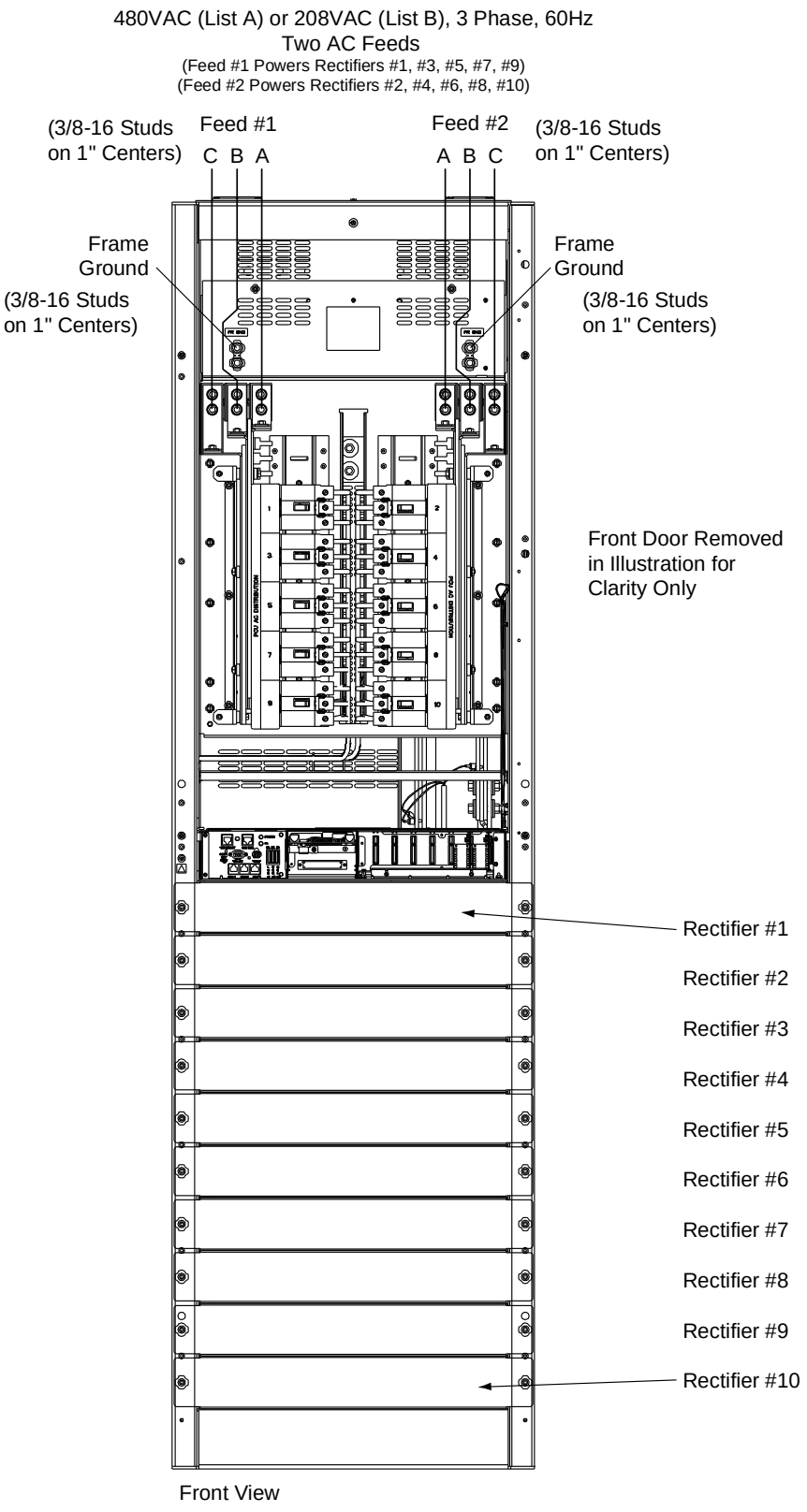
AC Input Connections to Lists 4 and 14 Power Only Bays (Two AC Feeds)



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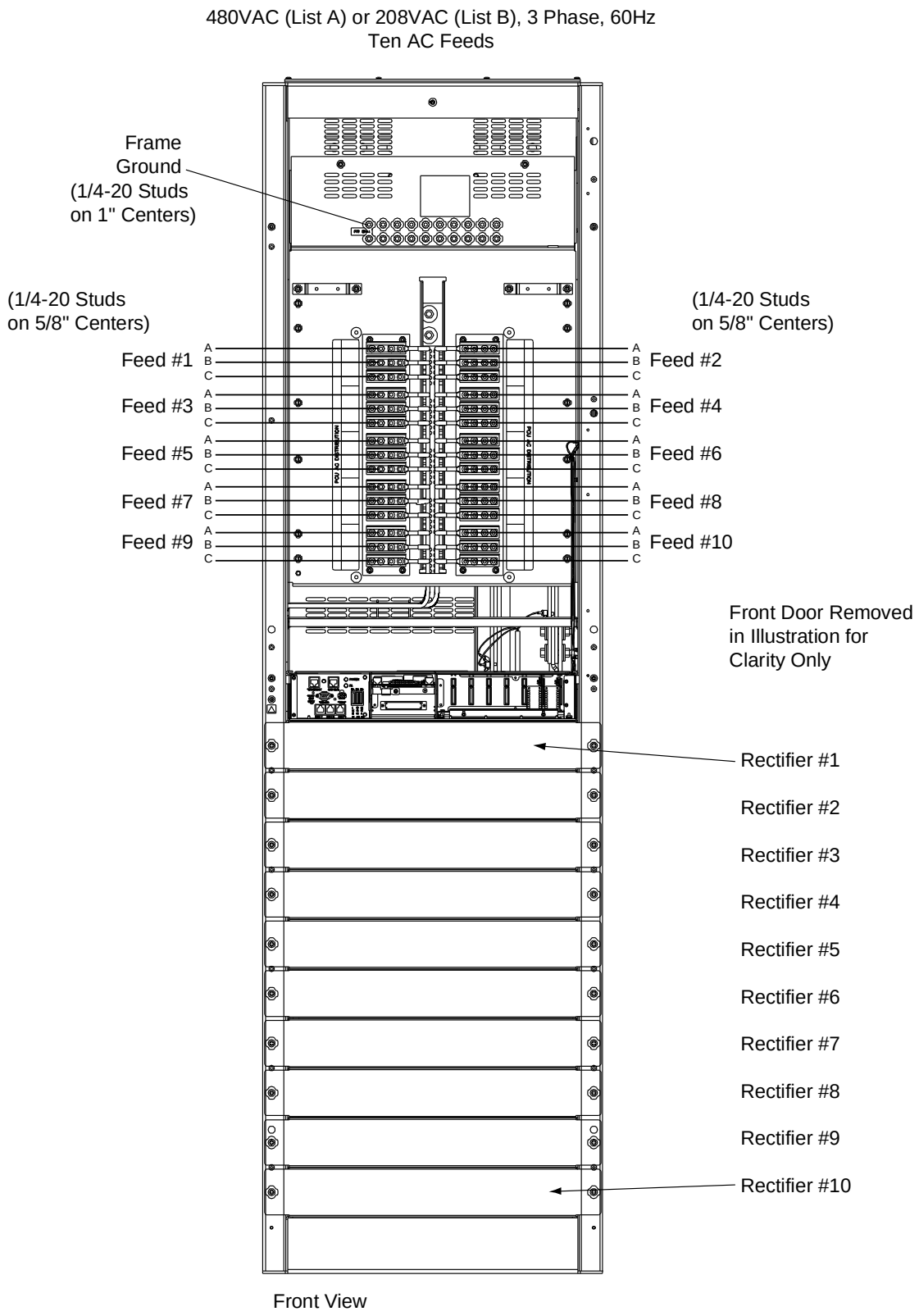
AC Input Connections to Lists 5 and 15 Power Only Bays (Ten AC Feeds)



Front View

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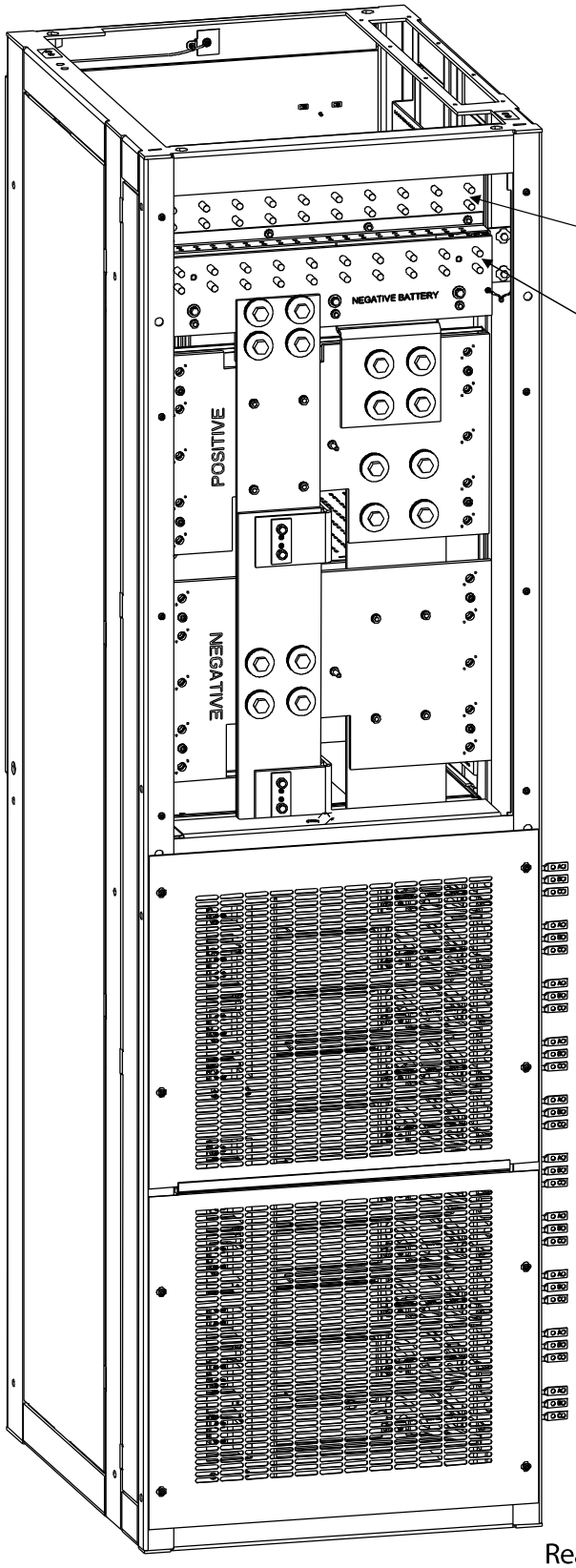
Battery Connections to Power/Distribution Bays



POSITIVE BATTERY
(GROUND RETURN +48V)

NEGATIVE BATTERY
(SUPPLY -48V)

Recm. Torque
3/8" Hardware using Belleville Lock Washer 180 in-lbs, using flat washer and lock washer 300 in-lbs.

Rear of Bay

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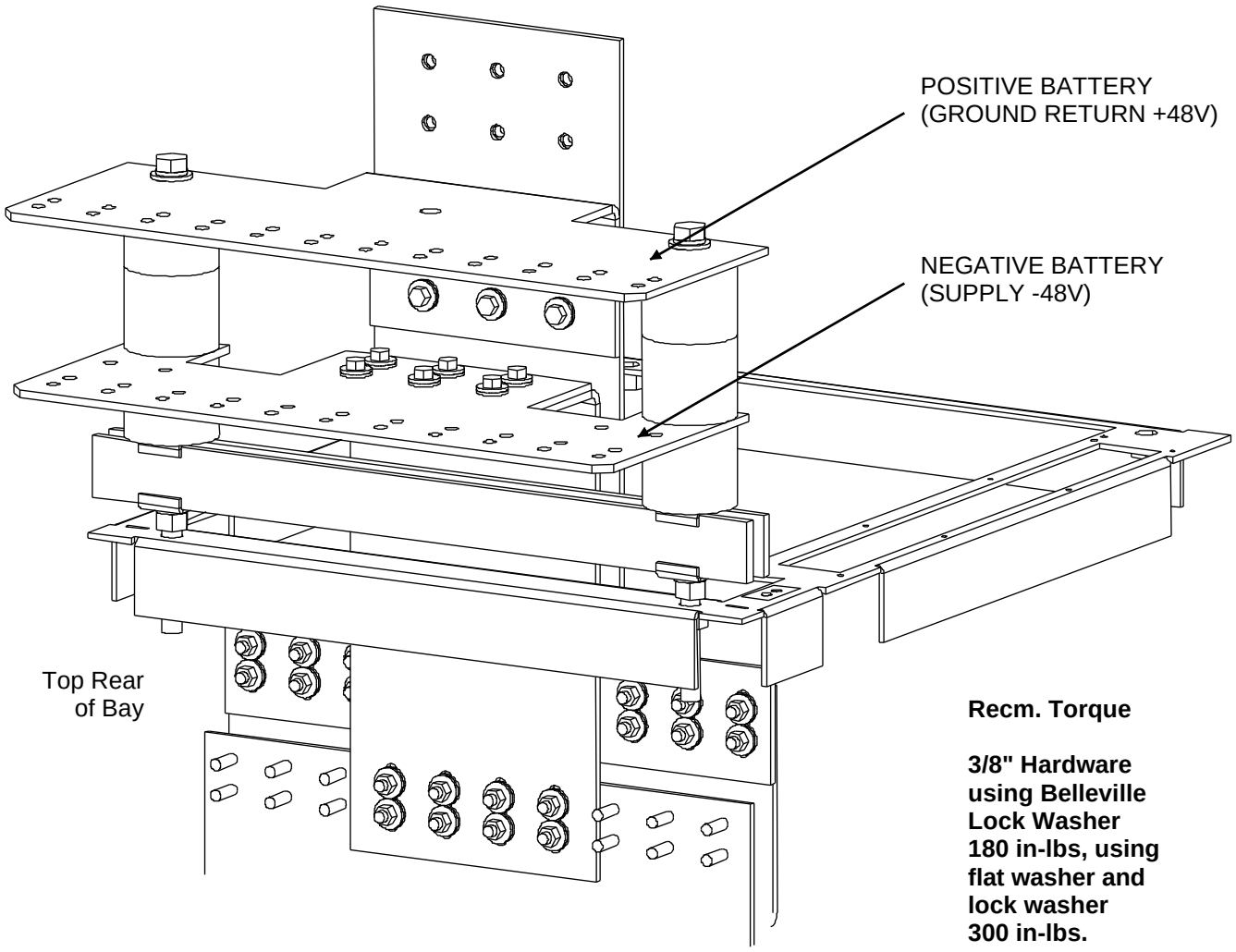

Recm. Torque

3/8" Hardware using Belleville Lock Washer 180 in-lbs, using flat washer and lock washer 300 in-lbs.

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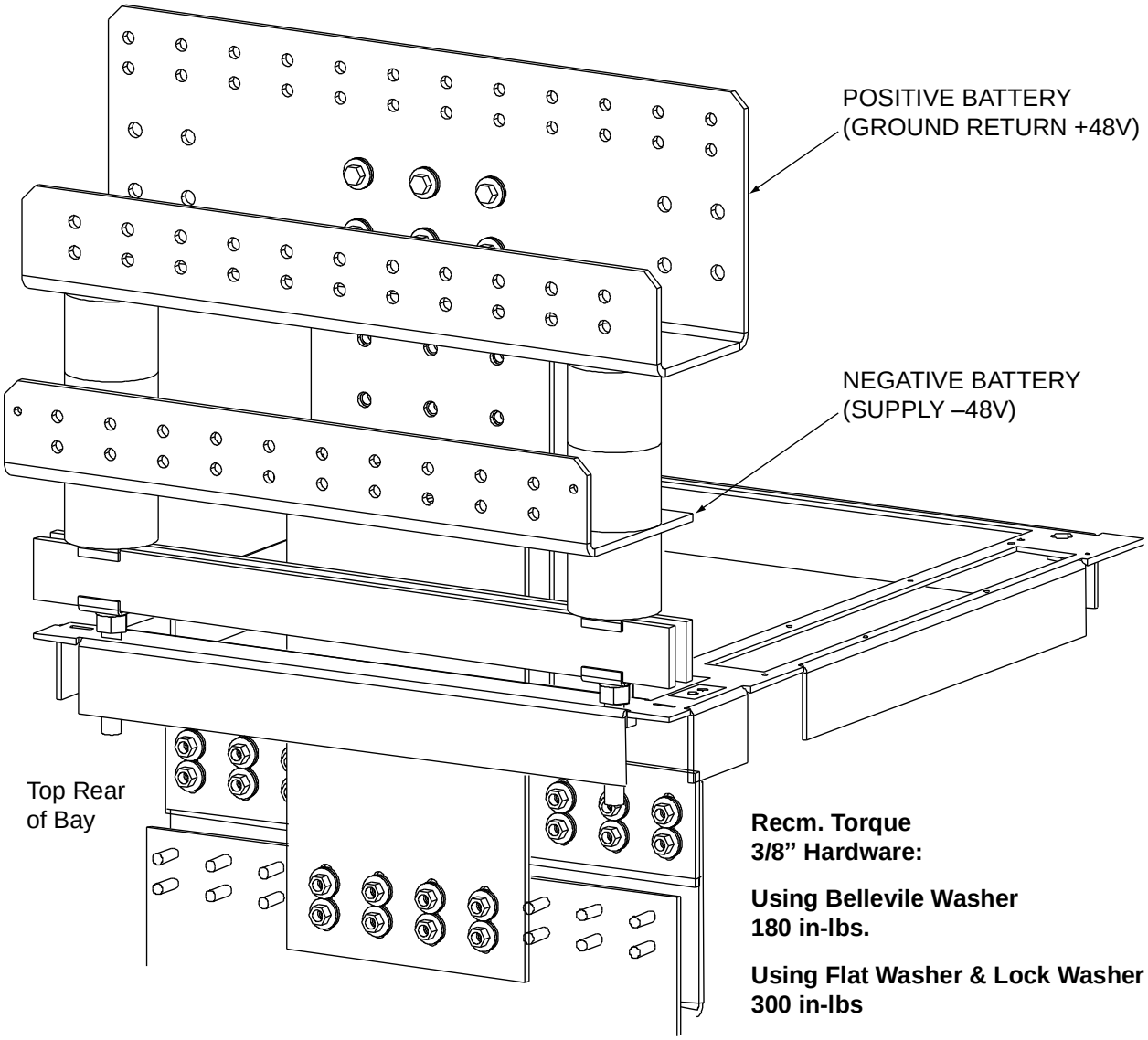

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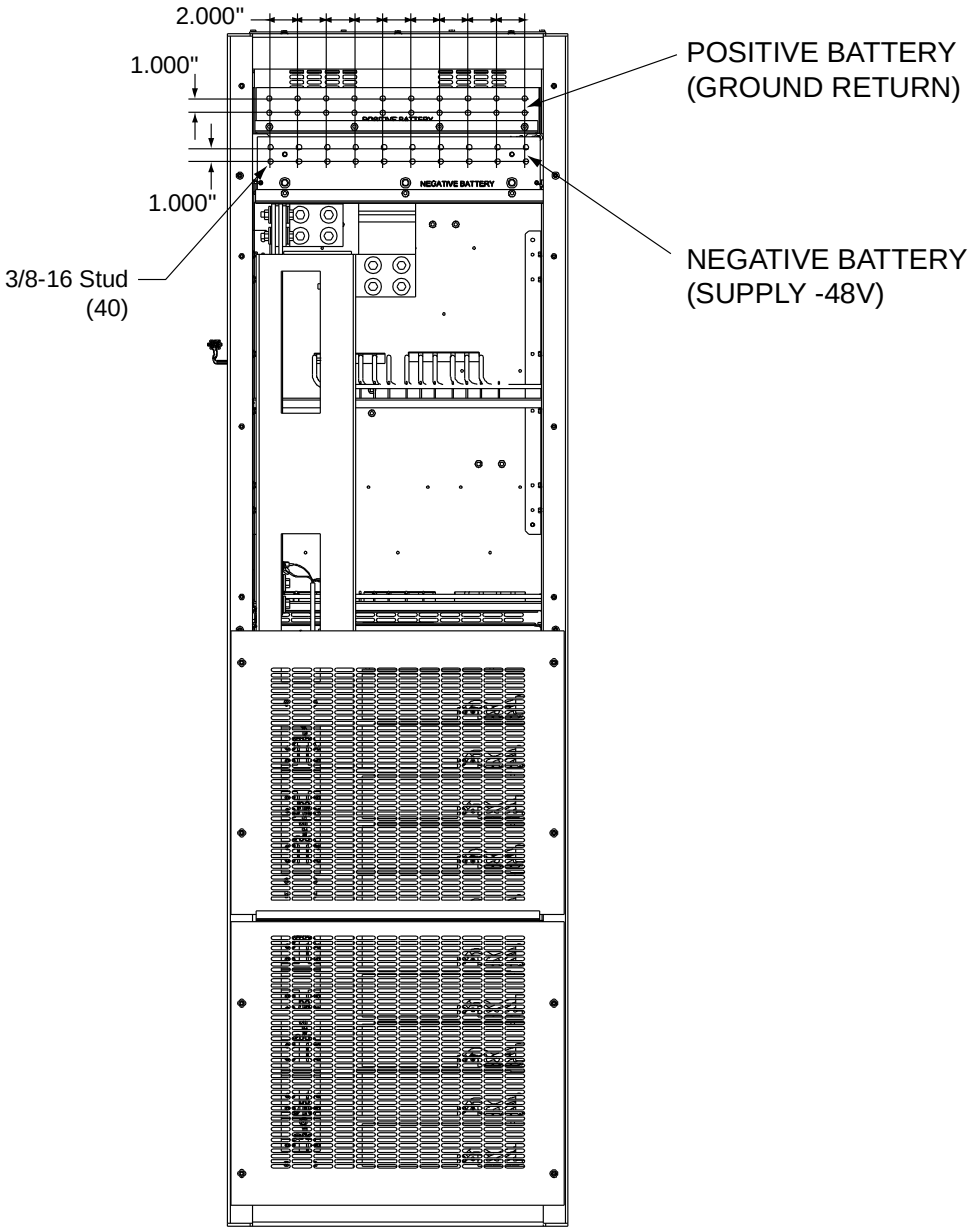
Battery Connections to Power Only Bays



Rear View
Power Only Bays

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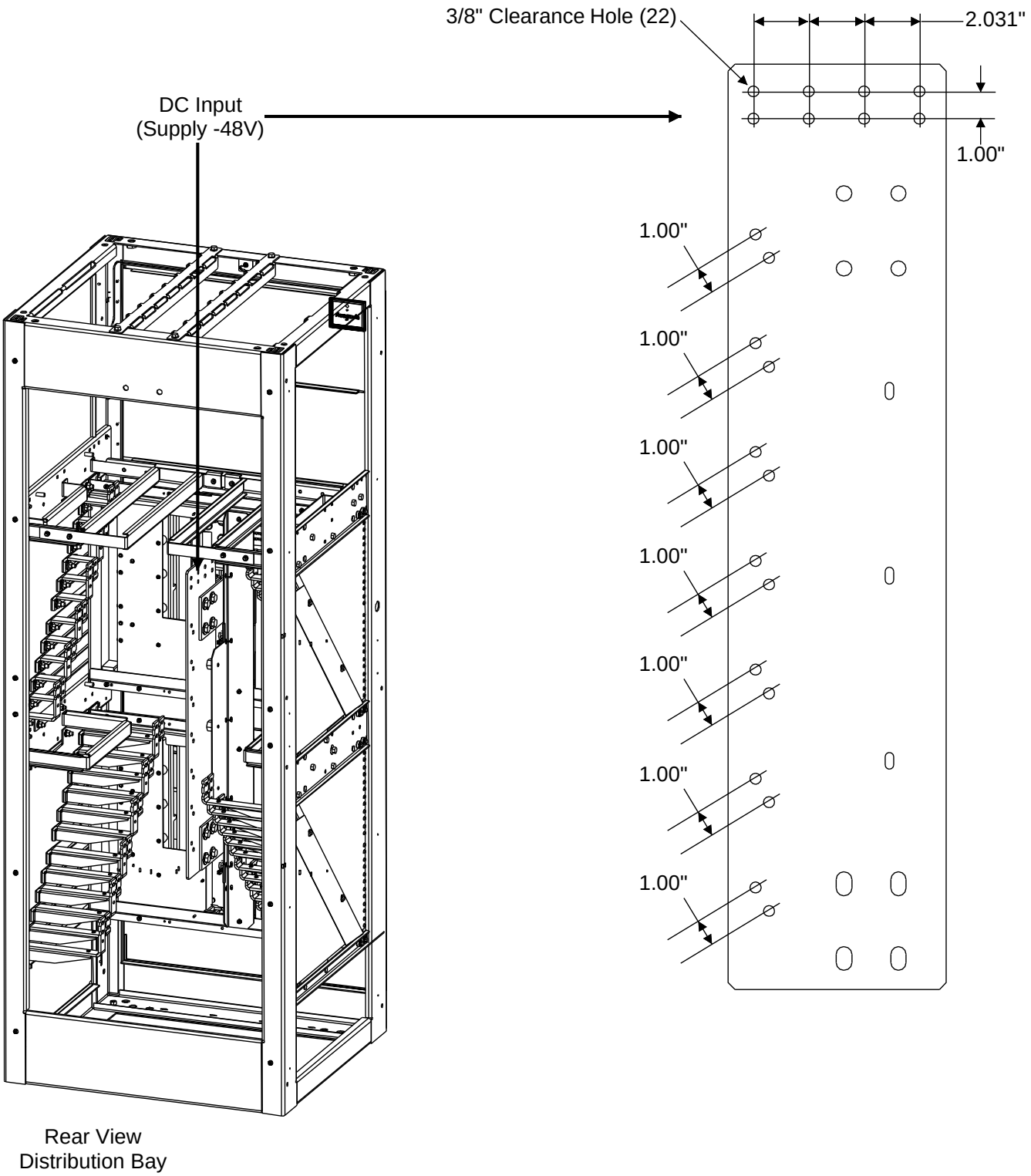
Battery Connection to Distribution Only Bays



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Installing Rectifiers into Power/Distribution and Power Only Bays

Install Rectifiers from top to bottom, starting with the top most mounting position. (In the MCA display messages, the Rectifiers are numbered from 1 to 10, starting with the top most position.) The Rectifier weighs approximately 40 lbs.

Procedure

1) Remove the blank panel from the Rectifier mounting position. Save this panel. The panel must be re-installed if a Rectifier is removed.

Note: *In the next step, a safety latch is present on the left-hand (as viewed from the front) side panel of each Rectifier. The latch is designed to prevent the Rectifier from inadvertently being removed completely from the Bay once it has been installed. It should not be necessary to depress the safety latch release when installing the Rectifier.*

2) Install the Rectifier into the bay by sliding it evenly into its mounting position. Secure the Rectifier to the bay by tightening the captive fasteners on the Rectifier.

3) Perform steps 1) and 2) for each Rectifier to be installed.

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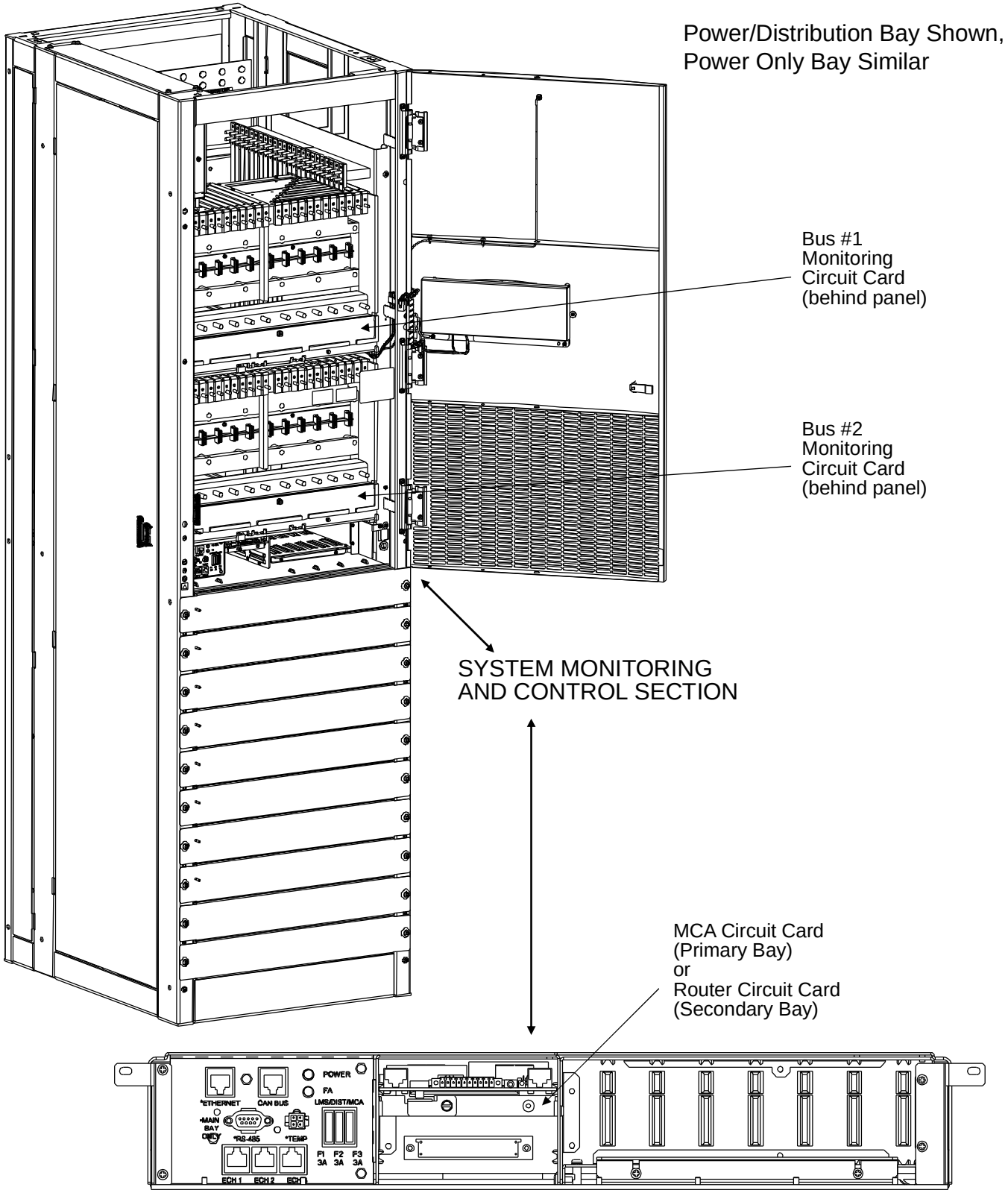
Switch and Jumper Options



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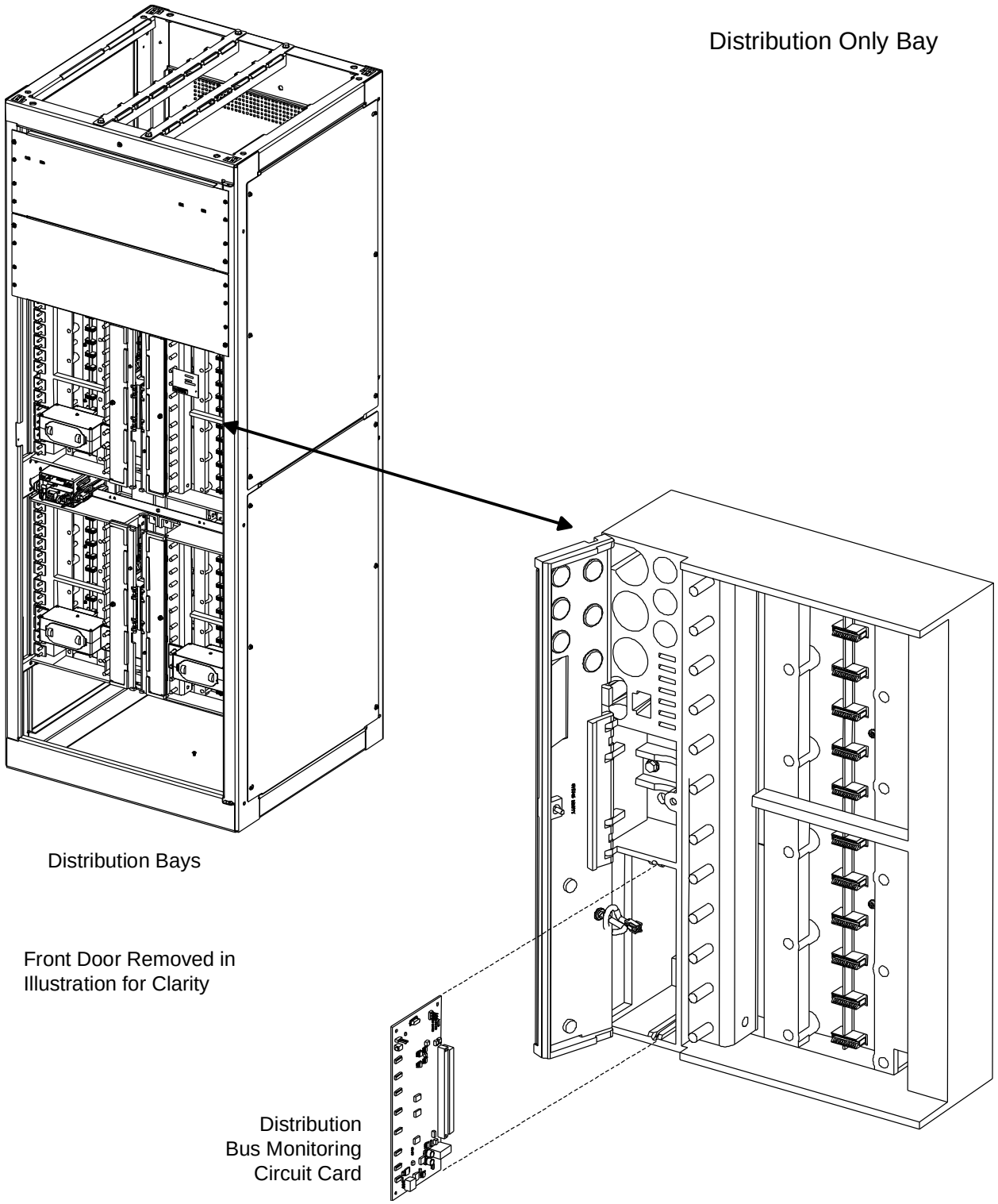

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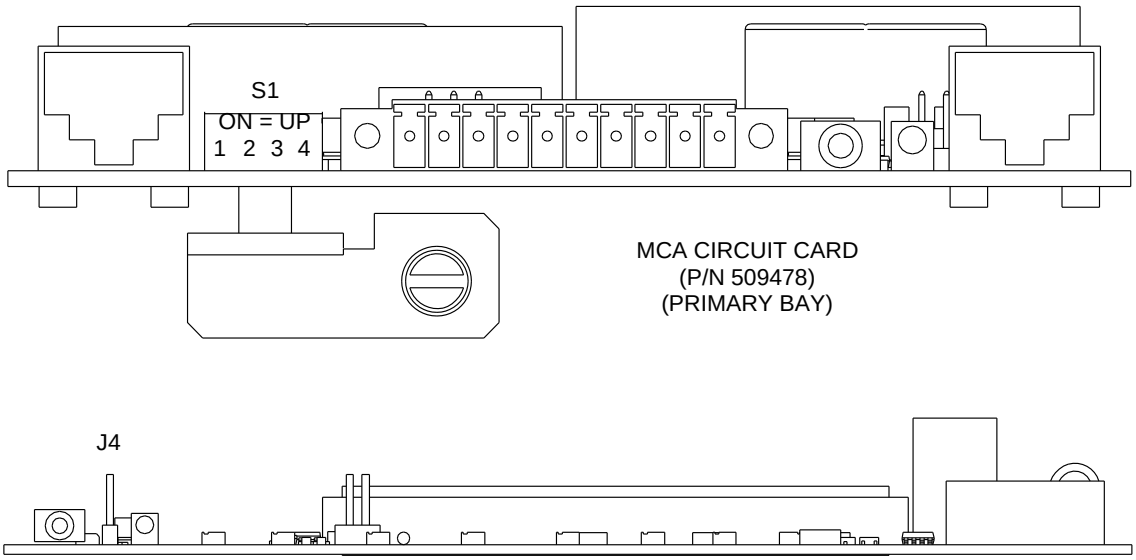

MCA DISTRIBUTION BUS MONITORING CIRCUIT CARD (P/N 524982)

Setting Switch S1 on the MCA Circuit Card in the Primary Power/Distribution and Power Only Bay

The individual switches of S1 have the following functions. Note that the switch ON position is the UP position.		
Switch of S1	**Designation**	**Function**
1	MCA	When in the ON position, the MCA section of the circuit card is disabled.
2	MON	When in the ON position, changing Power System settings via LMS is disabled.
3	KEY	When in the ON position, changing Power System settings via MCA Keypad is disabled.
4	PRO	When in the ON position, the remote uploading of new firmware into the circuit card is forced. This switch is used for diagnostic purposes only.

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Setting Jumper J4 on MCA Distribution Bus Monitoring Circuit Cards

Note: *If a jumper is changed on a live system, an alarm is generated. Update Inventory to clear the alarm.*

If the jumper is **installed** between the two pins of J4 on **ALL** MCA Distribution Bus Monitoring Circuit Cards, then there is **NO A or B distribution designation** in the MCA display of distribution items. If any MCA Distribution Bus Monitoring Circuit Card has the jumper **removed**, that distribution bus is **designated as B**. Those that have the jumper **remaining (installed)** are **designated as A**.

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REVISION RECORD

Issue	Change Number (ECO)	Description of Change
AA	LLP203036	New
AB	LLP203842	P/N 528482 Busbar Shield Kit added.
AC	LLP203895	Populating distribution device restrictions added.
AD	LLP209720	Distribution Only Bays Added.
AE	LLP211532	Model number changed, 480V Rectifier changed.
AF	LLP215440	Implementation of new spiral bound covers.
AG	LLP216269	Input redesigned. LMS Local Port on front door now USB (was RS-232). Distribution Only Bay Options deleted.
AH	LLP216553	Added P/N 547999 External Top-Mount Vertical Battery Input Busbar Assembly.
AJ	LLP216965	Added 582140001 distribution only bay and List C; added USB to Serial Converter Unit instructions, and USB type in illustration label, instructions to download and install USB drivers to customer computer, instructions on how to connect new bay to an old system
AK	LLP217313	Replaced 514431 with 554873, 547999 with 554874 and updated all related drawings accordingly. Reinstated 58214000016.
AL	LLP217720	Added Power Only Bay.
AM	LLP220220	Update Insulator Part Number from 245827100 to 245857000.

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